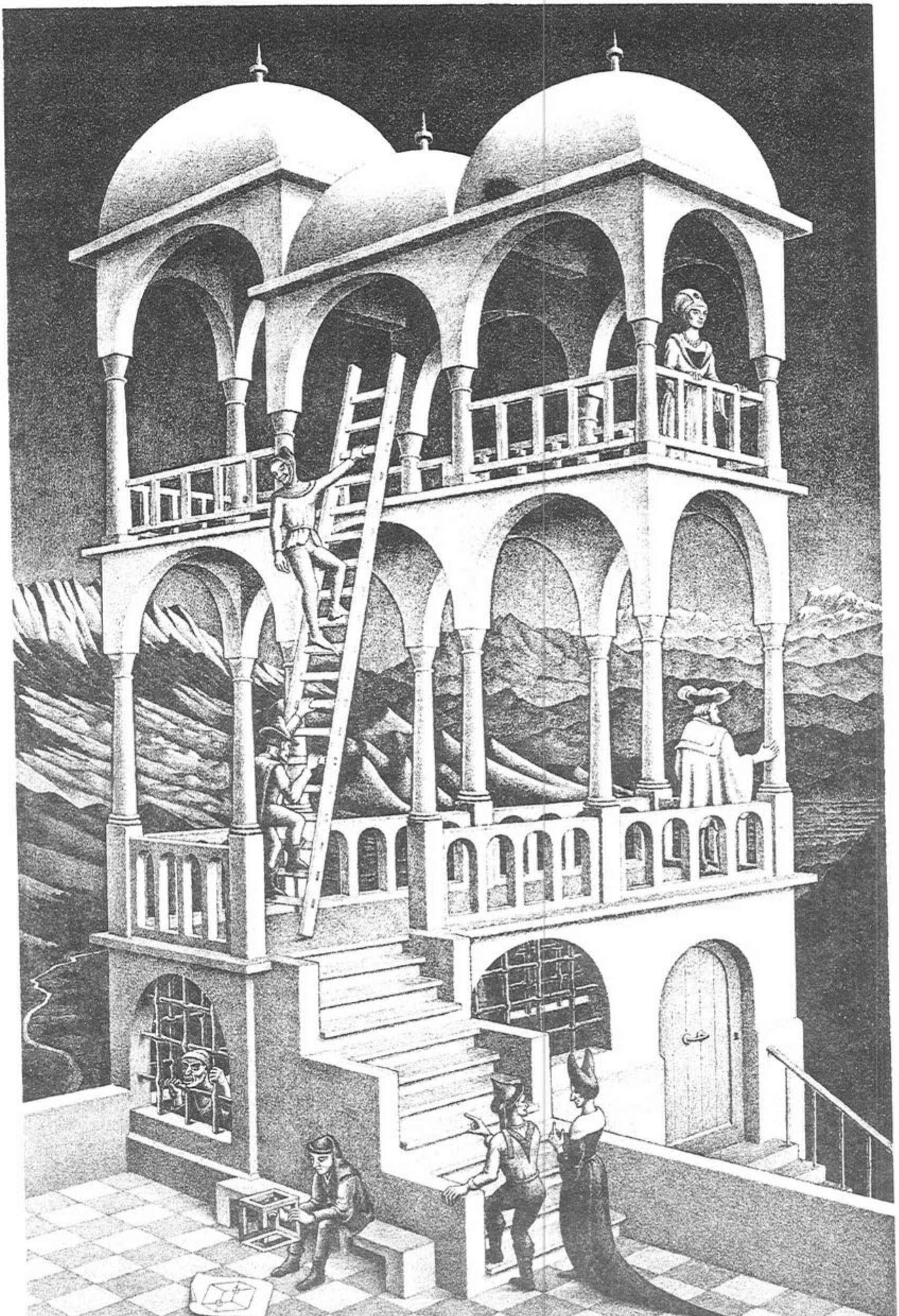
EXPLORING MEINONG'S JUNGLE AND BEYOND

To those who have troubled to learn its ways, the jungle is not the world of fear, danger and chaos popularly imagined and repeatedly portrayed by Hollywood, but a complex, beautiful and valuable biological community which obeys discoverable ecological laws. So it is with Meinong's theory of objects, which has often been disparaged, under the "jungle" epithet, as a place to be avoided or razed. Indeed the theory of objects *does* share some of the beauty and complexity, richness and value of a jungle: the system is not chaotic but conforms to precise logical principles, and in resolving philosophical problems, both longstanding and new, it is invaluable.



EXPLORING MEINONG'S JUNGLE AND BEYOND

An investigation of noneism and the theory of items

Richard Routley

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On page 0: Grady's Creek Flora Reserve, Border Ranges, New South Wales — photo by Henry Gold.

This unique area of mountain rainforest illustrates the richness and complexity of the jungle. Logging destroys these and other values, often irreversibly. Present plans are to dedicate the Flora Reserve as natural park, but *after* logging.

On page 410: Another World — M.C. Escher. Reproduced by permission of the Escher Foundation — Haags Gemeentemuseum — The Hague.

All remaining photographs are of Australian rainforest, several of them showing jungle of the Border Ranges — photos by Howard Hughes, The Australian Museum, (on pages 360, 536, 606, 790) and by Colin Totterdell (on pages 832, 990).

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To
Hugh Montgomery
and
Malcolm Rennie,
friends and fellow-workers
in past logical investigations

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THE FUNDAMENTAL PHILOSOPHICAL ERROR

PREFACE AND ACKNOWLEDGEMENTS

> A fundamental error is seldom expelled from philosophy by a single victory. It retreats slowly, defends every inch of ground, and often, after it has been driven from the open country, retains a footing in some remote fastness (Mill 47, pp.73-4).

The fundamental philosophical error, common to empiricism and idealism and materialism and incorporated in orthodox (classical) logic, is the Reference Theory and its elaborations. It is this theory (according to which truth and meaning are functions just of reference), and its damaging consequences, such as the Theory of Ideas (as Reid explained it), that noneism - in effect, the theory of objects - aims to combat and supplant. But like Wittgenstein (in 53), and unlike Mill, noneists expect no victories against such a pervasive and treacherous enemy as the Reference Theory. Though noneists take it for granted that "Truth is on their side", and reason too, the evidence that "Truth and reason will out" is exceedingly disappointing. Nor do they expect the enemy to vanish, even from open country: fundamental error will no doubt persist, to the detriment of philosophy, and of every theoretical and practical subject it touches. For there is great resistance to changing the framework (to amending the paradigm); so there is an attempt to handle everything within the prevailing philosophical frame. There is no need, it is thought, to change the framework, all problems can eventually be solved within the basic referential scheme - at worst by some concessions[1] which absorb some nonreferential fragments, and thereby decrease both the level of dissatisfaction with the going frame, and the prospects for perception of its real character.

The faith that the Reference Theory (and its forms such as extensionalism and empiricism) will find a way out of its impasses, a way to deal adequately with nonexistence and intensionality, is like the faith that technology will find a way to deal with social problems, especially with all the problems it creates (the faith is deeply embedded in the Technocratic Ideology). As with the Technocratic Ideology so with the Reference Theory, the Great Breakthrough which will resolve these problems, (patently) not soluble within the technological or referential framework, is always just around the corner, no matter how discouraging the record of failures in the past. The problems, difficulties, and failings of the Theory are not recognised as reasons for rejecting it and adopting a different theoretical and ideological framework, but are presented as "challenges", which further work and technology will doubtless find a way to resolve. And as with Technocracy the "solution" of a problem in one area is liable to create a rash of new problems in other areas (e.g. increasing energy supply at the expense of increased pollution, forest destruction, etc.), which can, however, for a time at least, be conveniently overlooked in the presentation of the "solution" as yet another triumph for the theory and its ideology. That is, the procedure is to trade in one problem for another, and hope that nobody notices.

The basic failings of the Reference Theory are at the logical level. The Reference Theory yields classical logic, and directly only classical logic: in this sense classical logic is the logic of the Reference Theory. An important group of elaborations of the Reference Theory correspond in the same way to logics in the Fregean mode. Accordingly with the breakdown of the Reference Theory and its elaborations all these logics fail; and so, as with the breakdown of modern energy supplies, substantial adjustment and reconstruction is required. In fact no less than the effects of a logical revolution are called for (see RLR), though the aim of these essays is to achieve such results in a more evolutionary way, to take advantage of the classical superstructure, to build the new logic in part on what there is. The logical areas where change and improved treatment are especially, and desperately, needed are these:

---

[1] An example of theoretical cooption is the (somewhat grudging) toleration of lower grades of modality and intensionality - which can however be referentially accounted for, more or less.

nonexistence and impossibility;
intensionality;
conditionality, implication and deducibility;
significance; and
context.

It is on the first two overlapping areas, the very shabby treatment of which is a direct outcome of the Reference Theory, that the essays which follow concentrate. (The remaining areas - which are, as will become quite evident, far from independent - are treated, still in a preliminary way, in two companion volumes to this work, RLR and Slog, and in other essays.) When the Reference Theory and its elaborations (such as Multiple Reference Theories) are abandoned the role of logic changes - its importance need not however diminish.

A special canonical language into which all clear, intelligible, worthwhile, admissible, ..., discourse has to be paraphrased is no longer required. Not required either is a professional priesthood to administer the highly inaccessible canonical technology for transforming into an acceptable intellectual product what can be salvaged from the language of natural speech and thought. Natural languages, accessible to and used by all, are more or less in order as they are, and logical investigation can be carried on, as indeed it usually is (the Reference Theory having its Parmenidean aspects), in extensions of these.

In a social context, the canonical language of classical logic can be seen as something of an ultimate in professionalisation. Its goal is the delegitimisation of the most basic and accessible natural tool of all - natural language and the reasoning and thought expressed in it - and its replacement by a new special, highly inaccessible and professionalised language for thought and reasoning, which alone can lay claim to clarity, logical soundness, and intellectual respectability. In contrast the alternative approach does not set out to replace or delegitimise the language of natural speech and thought; it is rather an extension and systematisation of natural language, and to some extent a theory of what can be truly said in it.

The role of semantics also changes: for natural language can furnish its own semantics, and semantics for logical extensions can also be accommodated into this framework. But the need for logic does not vanish with its changing role. Its importance remains for the precise formulation of theories, especially philosophical theories, and for their assessment, for the establishment of their coherence and adequacy in various logical respects, or for the demonstration of their inadequacy. And it retains its traditional importance for the assessment of arguments and analyses, and in the detection of fallacies.

Logic thus remains central to philosophy: for an important part of philosophy consists in argument and the giving of reasons and the location of fallacies and of gaps; and logic supplies and assesses the methods of reasoning and argumentation, exposes the assumptions and hidden premisses, and determines what the fallacies are and where they occur. Any substantial change in logical theory is therefore likely to have far-reaching effects throughout the remainder of philosophy. The impact, in this direction, on philosophy will, however, be slightly less catastrophic than might be anticipated, for this reason: many parts of philosophy no longer entirely rely on the defective methods furnished by received logical theory.

No, the main impact of the abandonment of the Reference Theory and its elaborations comes not through the new logic, but in other less expected ways. Firstly, the Reference Theory (or but a minor extension thereof) is an integral part of the main philosophical positions of our times, of empiricism and idealism and materialism. Seeing through the Reference Theory is a fundamental step in seeing through these positions and in escaping the problems they generate (in removing their problematics). Secondly, and connected with this, the Reference Theory and its elaborations reappear, in only thinly disguised forms, in the standard spectra of proposed solutions to such apparently diverse philosophical problems as those of universals, perception, intentionality, substance, self, and values. Noneism, by rejecting the basic assumptions, common to the standard, but invariably unsatisfactory, proposed solutions to the problems, casts much fresh light on all these perennial philosophical "problems".

The Reference Theory and its elaborations are considered in much detail, then, not merely because these theories are responsible for setting philosophy on a mistaken course, but also because the referential moves of these theories are re-enacted in many other philosophical areas, indeed in every major philosophical area. The same mistaken philosophical moves, deriving from the Reference Theory and its elaborations, appear over and over again in different philosophical arenas. In later chapters we shall see these moves made in metaphysics, in epistemology, in the philosophy of science; but they are also made in ethics, in political theory, and elsewhere, in each case with serious philosophical costs.

In sum, both received logical theory and mainstream philosophical thinking involve, according to noneism, fundamentally mistaken assumptions, especially those of the Reference Theory and its reflections in other areas. In part the essays which follow are devoted to exposing these assumptions, to arguing their inadequacy in detail and to showing how they have generated very many spurious philosophical and logical problems, and effectively diverted philosophical investigation into hopeless deadends. In part the essays are positive: they are concerned with the investigation of alternative theories and, in particular, the construction of one important alternative sort of theory, noneism, and with showing how that theory, by transposing the setting of philosophical issues, eliminates or greatly reduces in severity the usual philosophical problems and impasses. There are, however, no philosophical ways without problems, and each new theory generates its own set. Noneism is no exception; it has already problems of its own (though they are, for the most part, not where critics have located them). Nevertheless it would be pleasant if the new theory (which is really only a higher tech but still low impact elaboration of older, but minor, theories) were an approximation to a part of - the central part of - the correct philosophical theory, of the truth.

THE MAIN PROBLEMS TO BE EXPLORED

Among the main problems to be explored are those of the logical behaviour of nonentities; in particular, the problem of precisely which properties and sorts of properties things which do not exist have, and the problem of the logical behaviour of objects (whether they exist or not) in more highly intensional settings, e.g. of criteria for identity. Some of these problems are old and were of concern to many philosophers in the past, e.g. riddles of nonexistence and problems of how nonentities have properties and which ones they have: but many of the problems are new. Although these main problems can now be seen as part of the semi-respectable subject of semantics, western philosophers seem to have been lulled into complacency about them by the generally prevailing empiricist climate. In semantical terms the central problem is that of explaining the truth of nonreferential statements (of intensional statements and of statements apparently about nonentities), explaining which types of such statements are true, and what the status of those which are not true is - in short, providing a semantical theory which can account, without distortion of their meaning, for their truth.

One measure of the modern philosopher's complacency about these central problems is that it has become standard to regard the most basic of them as having been rather satisfactorily dissolved, if not by Russell's theory of descriptions and proper names, then by one of its minor referential variations such as Strawson's theory or Quine's theory or, to be more up to date, Donnellan's theory or Putman's theory or Kripke's theory. Russell's theory, students are taught, is a philosophical paradigm which has resolved these ancient problems and confusions once and for all, rendering unnecessary the investigation of alternative solutions.[1] But once these problems are taken seriously the empiricist dogmas which currently pass for final solutions to them can be seen to be far from satisfactory and to depend crucially on dismissing or ignoring the new problems and difficulties which arise over the supposed reanalyses of the problematic statements. These problems must however be taken as fundamental, they cannot be explained away as pseudo-problems or dismissed as unscientific or not worth bothering about, and the problematic statements present important data that any adequate theory of language, truth, and meaning must give a satisfactory explanation of. No referential theory succeeds in accounting for this data.

The widespread but mistaken satisfaction with classical logical theory (essentially Russell's theory) has led to a failure to search for radical alternatives to it or to assess carefully earlier radical alternatives. A main theme of the essays is that a theory with a good deal in common with Meinong's theory of objects, but in a modern logical presentation, offers a viable alternative to classical logical theories, to modern theories of quantification, descriptions, identity, and so on, and provides a superior account of the crucial data to be taken account of.

Meinong's theory provides a coherent scheme for talking and reasoning about all items, not just those which exist, without the necessity for distorting or unworkable reductions; and in doing so it attributes, it is bound to attribute, features to nonentities - not merely to possibilia but also to impossibilia. It is these aspects, in particular, of Meinong's theory which have given rise to severe criticism, especially from empiricists: it is claimed that nonentities, especially impossibilia, are hopelessly chaotic and disorderly, that their behaviour is offensive and their numbers excessive. For most philosophers, Meinong is a bogeyman, and Meinong's theory of objects a treacherous, dangerous and overlush environment to be avoided at all philosophical costs. These are the attitudes which underlie remarks about "the horrors of Meinong's jungle" and many others in a similar vein which most of those who have written on Meinong have felt the urge to construct. For these sorts of bad philosophical reasons Meinong's theory is generally regarded as thoroughly discredited; and until very recently no one has bothered to look very hard at the formal structure of theories of Meinong's sort, or to examine the sort of alternative they present to Russellian-style theories.

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[1] The common idea that it is a paradigm of philosophical analysis comes from Ramsay 31, p.263 n.

A popular variation on rubbishing Meinong's theory is misrepresenting it, often by importing assumptions drawn from the rival Russellian (or Fregean) theory, so that it can be made to appear as an extravagant platonistic version of that theory and one whose "ontology" includes any old impossible objects. Platonistic construals of the theory of objects are entirely mistaken.

The alternative nonreductionist theories of items developed in what follows - which differ from Meinong's theory of objects in many important respects - are, hopefully, less open than Meinong's to misconstrual and misrepresentation of these sorts (of course, no theory is immune). But chicanery of these and other kinds is only to be expected; for it is by sophistical means, and not in virtue to truth and reason, that the Reference Theory will maintain its classical control over the logical landscape.

* * * * * *

My main historical debt is of course to the work of Alexius Meinong. But, as will become apparent, I am also indebted to the work of precursors of Meinong, in particular Thomas Reid. I have been much helped by critical expositions of Meinong's work, especially J.N. Findlay 63, and, in making recent redraftings of older material, by Roderick Chisholm's articles. I have been encouraged to elaborate earlier essays and much stimulated by recent attempts to work out a more satisfactory theory of objects than Meinong's mature theory, in particular the (reductionist) theories of Terence Parsons. That I am, or try to be, severely critical of much other work on theories of objects in no way lessens my debt to some of it.

Among my modern creditors I owe most to Val Routley, who jointly authored some of the chapters (chapters 4, 8 and 9), and who contributed much to many sections not explicitly acknowledged as joint. For example, the idea that the Reference Theory underlay alternatives to the theory of objects and generated very many philosophical problems, was the result of joint work and discussion.

I have profited - as acknowledgements at relevant points in the text will to some extent reveal - from constructive criticism directed at earlier exposure of this work, in particular extended presentations in seminar series at the University of Illinois, Chicago Circle, in 1969, at the State University of Campinas in 1976, and at the Australian National University in 1978.

On the production side I have been generously helped, in almost every aspect from initial research to final proofing and distribution, by Jean Norman, without whose assistance the volume would have been much slower to appear and much inferior in final quality. Many people have helped with the typing, design, printing, organisation, financing and distribution of the text. To all of them my thanks, especially to Anne Van Der Vliet, who did much of the typing of the final version, often from very rough copy, and to Brian Embury who contributed much to the final stages of production.

ORIGINS OF THE MATERIAL PRESENTED

* * * * * *

Although a book of this size has (inevitably) involved much labour over a long period, the result remains far from satisfactory at a good many points. For these lapses I beg a modicum of tolerance from the (perhaps hostile) reader. It is partly this remaining unsatisfactoriness, partly because overlap between sections of the book has not been entirely eliminated, partly because despite the burgeoning length of the book the investigation of several crucial matters for noneism remains incomplete or yet to be worked out properly, and partly because of the format, that the production is presented as an interim edition. It may be that the project will never progress beyond that stage; but I was determined - and finally forced by a deadline - to achieve a clearing of my desks, and to try to organise folders full of (sometimes stupid and often repetitious) notes and partly completed manuscripts into some sort of more coherent, intelligible, and accessible whole. In the course of this organisation I have drawn on much earlier work, which has shaped the format of the present edition.

Firstly, some of the essays which follow are redraftings, mostly with substantial changes and additions, of previous essays, which they supersede. Main details are as follows:

Chapter 1 incorporates the whole of 'Exploring Meinong's Jungle', cyclostyled, 116 pages plus footnotes, completed in 1967, subsequently re-entitled 'Exploring Meinong's Jungle. I. Items and descriptions'. A shortened version of the paper (55 pages comprising roughly the first half of the original paper) was prepared for publication under the latter title, and was accepted by the Australasian Journal of Philosophy. But owing to my growing dissatisfaction with the paper requisite minor revision and retyping of the shortened paper was never undertaken. In later parts of chapter 1 passages from earlier papers are borrowed: the main object of these and other borrowings in subsequent chapters has been to make the book rather more independent of work published elsewhere.

Chapter 2 - which has not been subject to nearly as much revision as it deserves - incorporates virtually all of 'Existence and identity when times change', a 69 page typescript from 1968. The paper was subsequently re-entitled 'Exploring Meinong's Jungle. II. Existence and identity when times change'. Professor Sobocinski kindly offered in 1969 to publish both parts, I and II, of 'Exploring Meinong's Jungle' in the Notre Dame Journal of Formal Logic. Perhaps fortunately for other contributors to the Journal, part II was never submitted in final form, and part I has recently been withdrawn.

Parts of several of the newer essays have been published elsewhere; Chapter 3 in Philosophy and Phenomenological Research; Chapter 6 in Grazer Philosophische Studien; Chapter 7 in Poetics; Chapter 8 in Dialogue; the Appendix (referred to as UL) in The Relevance Logic Newsletter; while some of Chapter 4 has previously appeared in Revue Internationale de Philosophie, the remainder of the paper involved (referred to as Routley^{2}73) being largely taken up in Chapter 1. Excerpts from earlier articles on the logic and semantics of nonexistence and intensionality and on universal semantics have also been included in the text; these are drawn from the following periodicals: Notre Dame Journal of Formal Logic (papers referred to as EI, SE, NE), Philosophica (MTD), Journal of Philosophical Logic (US), Communication and Cognition (Routley^{2}75), Inquiry (Routley 76), and Philosophical Studies (Routley 74). Permission to reproduce material has been sought from editors of all the journals cited, and I am indebted to most editors for replies granting permission.

REFERENCES, NOTATIONS, NOTES FOR READERS

Parts of many of the essays have been read at conferences and seminars in various parts of the world since 1965 and some of the material has as a result (and gratifyingly) worked its way into the literature. It is pleasant to record that much of the material is now regarded as far less crazy and disreputable than it was in the mid-sixties, when it was taken as a sign of early mental deterioration and of philosophical irresponsibility.

*   *   *   *   *   *

References, notation, etc. Two forms of reference to other work are used. Publications which are referred to frequently are usually assigned special abbreviations (e.g., SE, Slog); otherwise works are cited by giving the author's name and the year of publication, with the century deleted in the case of the twentieth century. In case an author has published more than one paper in the one year the papers are ordered alphabetically.

The bibliography records only items that are actually cited in the text. Also included however is a supplementary bibliography on Meinong and the theory of objects (compiled by Jean Norman) which extends and updates the bibliographies of Lenoci 70 and Bradford 76. Delays in production made feasible - what was always thought desirable (as even the *authors* of Slog have repeatedly found) - the addition of an index: this too was compiled by Jean Norman.

In quoting other authors the following minor liberties have been taken: notation has been changed to conform with that of the text, and occasionally passages have been rearranged (hopefully without distortion of content). Occasionally too citations have been drawn from unfinished or unpublished work (in particular Parsons 78 and Tooley 78) or even from lecture notes (Kripke 73): sources of these sorts are recorded in the bibliography, and due allowance should be made.

Standard abbreviations, such as 'iff' for 'if and only if' and 'wrt' for 'with respect to', are adopted. The metalanguage is logicians' ordinary English enriched by a few symbols, most notably '→' read 'if ... then ...' or 'that ... implies that ...', '&' for 'and', 'v' for 'or', '~' for 'not', 'P' for 'some' and 'U' for 'every'. These abbreviations are not always used however, and often expressions are written out in English.

Cross references are made in obvious ways, e.g. 'see 3.3' means 'see chapter 3, section 3' and 'in §4' means 'in section 4 (of the same chapter).' The labelling of theorems and lemmata is also chapter relativised. Notation, bracketing conventions, labelling of systems is as explained in companion volume RLR; but in fact where these things are not familiar from the literature or self-explanatory they are explained as they are introduced.

*   *   *   *   *   *

Notes for prospective readers. By and large the chapters (and even sections) can be read in any order, e.g. a reader can proceed directly to chapter 3 or to chapter 9, or even to section 12.3. Occasionally some backward reference may be called for (e.g. to explain central principles, such as the Ontological Assumption), but it will never require much backtracking.

In places, especially part IV of chapter 1, the text becomes heavily loaded with logical symbolism. The reader should not be intimidated. Everything said can be expressed in English, and commonly is so expressed, and always a recipe is given for unscrambling symbolic notation into English. However the symbolism is intended as an aid to understanding and argument and to exact formulation of the theory, not as an obstacle. Should the reader become bogged down in such logical material or discouraged by it, I suggest it be skipped over or otherwise bypassed.

In the interest of further development of the theory, I should appreciate feedback from readers, e.g. suggestions for improvements, of problems, additional arguments, further objections, and of course copies of commentaries.

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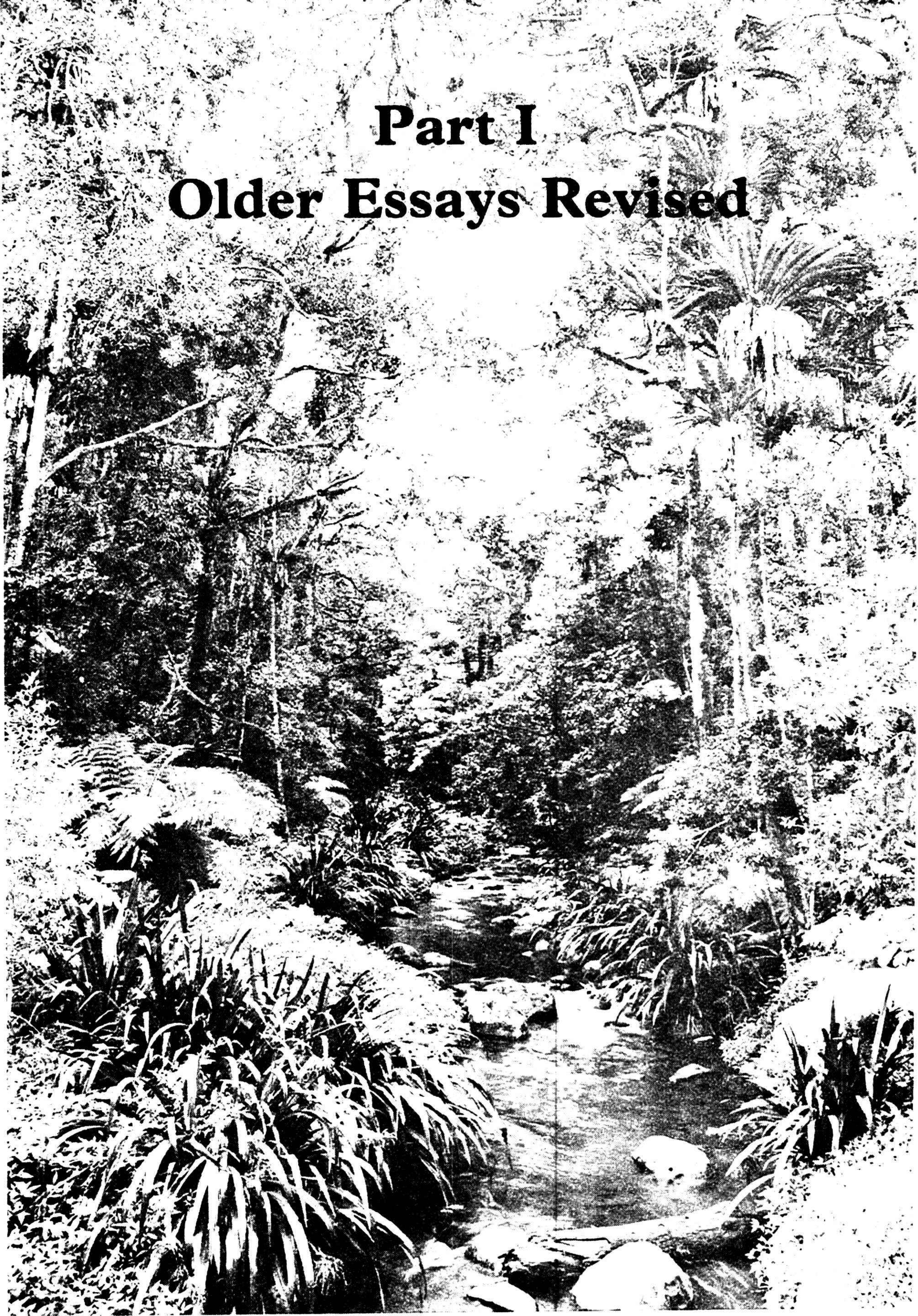

1.0 THE NONEIST TRADITION

CHAPTER 1

EXPLORING MEINONG'S JUNGLE AND BEYOND

I. ITEMS AND DESCRIPTIONS

> ... what is to be an object of knowledge does not in any way have to exist ... . The fact is of sufficient importance for it to be formulated as the principle of the independence of manner of being from existence, and the domain in which this principle is valid can best be seen by reference to the circumstances that there are subject to this principle not only objects which in fact do not exist, but also such as cannot exist because they are impossible. Not only is the oft-quoted golden mountain golden but the round square too is as surely round as it is square ... . (A. Meinong 04; also 60, p.82).

I. Noneism and the theory of items

There is an important, but largely underground, philosophical current running at least from the Epicureans to modern times, with major outflowings in Reid and in Meinong,[1] according to which many of a wide variety of the objects, both individual and universal, that many of us ordinarily talk about and think about, do not exist in any way at all. Thus the Epicureans, early radicals,

> deprive many important things of the title of "existent", such as space, time, and location - indeed the whole category of lekta (in which all truth resides); for these, they say, are not existents, although they are something (Plutarch, Adversus Colotem, 1116 B).

The same theses will be defended in what follows. None of space, time or location - nor, for that matter, other important universals such as numbers, sets or attributes - exist; no propositions or other abstract bearers of truth exist: but these items are not therefore nothing, they are each something, distinct somethings, with quite different properties, and, though they in no way exist, they are objects of discourse, of thought, and of quantification, in particular of particularisation. Similar theses are to be found in Reid, in whose work they obtain much further elaboration:

---

[1] The stream also surfaces, sometimes but briefly, in the work of Abelard, of William of Shyreswood, of Descartes (who introduced a nonexistential particular quantifier, datur), of Mill (who, while insisting upon existentially loaded quantification, qualified the Ontological Assumption) and, more recently, of Curry and Lejewski - and presumably elsewhere. I should like to obtain fuller documentation of the history of noneism, and would welcome details from those who have them or can locate them. Not all the tributaries of the stream are confined to western philosophy. Leading theses of noneism also emerge, so it appears, in the thought of some Buddhist logicians: cf. Matilal 71, chapter 4.

> ... we have power to conceive things which neither do nor ever did exist. We have power to conceive attributes [universals, ideas] without regard to their existence. The conception of such an attribute is a real and undivided act of the mind; but the attribute conceived is common to many individuals that do or may exist. We are too apt to confound an object of conception with the conception of that object.
>
> ... the Platonists ... were led to give existence to ideas, from the common prejudice that everything which is an object of conception must really exist; and, having once given existence to ideas, the rest of their mysterious system about ideas followed of course; for things merely conceived have neither beginning nor end, time nor place; they are subject to no change ...
>
> These are undeniable attributes of the ideas of Plato; and, if we add to them that of real existence, we have the whole mysterious system of Platonic ideas. Take away the attribute of existence, and suppose them not to be things that exist, but things that are barely conceived, and all the mystery is removed ... (Reid 1895, 403-4).

Just how the mystery is removed, Reid has already explained in detail (see his discussion of the nature of a circle, p.371).

The position arrived at - hereafter called (basic) noneism, also spelt and pronounced 'nonism' - is thus neither realism nor nominalism nor conceptualism. It falls outside the false classifications of both the ancient and modern disputes over universals, since these classifications rest upon an assumption, the vulgar prejudice Reid refers to, which noneism rejects.

By far the fullest working out of these noneist themes - which are firmly grounded in commonsense but tend to lead quickly away from current philosophical "commonsense" - is to be found in the work of Meinong, especially in Meinong's theory of objects, central theses of which include these:

M1. Everything whatever - whether thinkable or not, possible or not, complete or not, even perhaps paradoxical or not - is an object.

M2. Very many objects do not exist; and in many cases they do not exist in any way at all, or have any form of being whatsoever.

M3. Non-existent objects are constituted in one way or another, and have more or less determinate natures, and thus they have properties. In fact they have properties of a range of sorts, sometimes quite ordinary properties, e.g. the oft-quoted golden mountain is golden. Given a subdivision of properties into (what may be called) characterising properties and non-characterising properties, further central theses of Meinong's can be formulated, namely:-

M4. Existence is not a characterising property of any object. In more old-fashioned language, being is not part of the characterisation or essence of an object; and in more modern and misleading terminology, existence is not a predicate (but of course it is a grammatical predicate). The thesis holds, as we shall see, not merely for 'exists', but for an important class of ontological predicates, e.g. 'is possible', 'is created', 'dies', 'is fictional'.

M5. Every object has the characteristics it has irrespective of whether it exists; or, more succinctly, essence precedes existence.

M6. An object has those characterising properties used to characterise it. For example, the round square, being the object characterised as round and square, is both round and square.

Several other theses emerge as a natural outcome of these theses; for example:

M7. Important quantifiers, in fact of common occurrence in natural language, conform neither to the existence nor to the identity and enumeration requirements that classical logicians have tried to impose in their regimentation of discourse. Among these quantifiers are those used in stating the preceding theses, e.g. 'everything', 'very many', and 'in many cases'. A similar thesis holds for descriptors, for instance for 'the' as used in 'the round square'.

The theory of objects - or of items, to use a more neutral term - to be outlined integrates, extends, and fits into a logical framework, all the theses introduced from the Epicureans, from Reid and especially from Meinong. Perhaps the most distinctive feature of Meinong's theory - as compared with earlier theories - is that objects are not restricted, as in the usual rationalist theories and in modern modal logic, to possible objects, but are taken to embrace impossible objects, and these impossibilia are also allowed a full role as proper subjects. Thus all logical operations apply to impossibilia as well as to possibilia and entities. And thesis M6 holds for impossibilia: so, for example, Meinong's round square is both round and square, and thus both round and not round. This seems to be the feature of Meinong's theory which has caused most consternation. But though it is a source of difficulty for Meinong it is also the source of great advantages; for it is this feature that enables Meinong to avoid one of the most arbitrary features of rationalism: the limitation of objects to possible objects. Rationalists merely put off to the possibility stage the same sort of problem that faced empiricists at the entity stage, namely the problem of how we manage to make the true statements we do make about objects beyond the pale, in the rationalists' case impossible objects. For intensional operators do not stop short at possibility; and impossible objects may be the object of thoughts and beliefs just as much as possible ones, they may be the subjects of true statements, e.g. in mathematical reductio proofs, and so on. There is then a straightforward case for not arbitrarily stopping at possibility; and it is just the extension to impossibilia that entitles Meinong's theory, unlike usual rationalist and platonist theories, to claim to provide a general solution to such logical problems as that of quantifying into intensional sentence contexts (i.e. of binding variables within the scope of intensional functors).

From the fact that impossibilia are admitted as proper subjects of true statements along with possibilia, it does not follow that there is no difference between their logical behaviour and that of possibilia. Of course there are differences, but none that excludes either as proper subjects. The traditional and widespread notion that impossibilia are beyond logic or violate the laws of logic, that they are not amenable to logical treatment and cannot be proper subjects, is mistaken.

Although the theory to be outlined has a great deal in common with Meinong's mature theory of objects, and indeed borrows heavily therefrom, it diverges from Meinong's theory substantially as regards objects of higher order, and also on some issues of detail at the lower order. In some respects the theory advanced goes well beyond Meinong's theory; for Meinong scarcely developed the logic underlying his theory of objects, and in fact left some crucial logical issues unresolved and resolved others in an unsatisfactory or unclear fashion, in particular the vital issue of restrictions on the characterisation postulate (effectively M6) and the question of the logical status of paradoxical (or defective) objects. The theory to be presented here, the theory of items, (to invoke 'items' now as a distinguishing term), unlike Meinong's theory assigns no being or subsistence to objects of higher order. For example, whereas Meinong speaks of the being and non-being of objectives and the subsistence of many objects which do not exist, the theory of items avoids, and rejects as misguided, such subsistence terminology. Rather the theory follows the Epicureans and Reid in allowing no being whatsoever to propositions, attributes and other abstract objects. Also the jungle we are to explore further was only partly charted by Meinong. For instance, an understanding of the semantical basis of the theory of items and the way it differs from the classical theory requires consideration not only of existence requirements but also of identity requirements, but Meinong scarcely considers modern logical problems concerning identity. Moreover some of Meinong's earlier maps of the jungle made when he still laboured under the influence of empiricism of the jungle and of Hume and Brentano in particular, contain serious inaccuracies. We should beware of being misled by them, or of too heavy a reliance on Meinong's work.[1]

Even though the theory of items differs in many respects from Meinong's theory of objects, many of the things Meinong wanted to say of objects can be said in the new theory using different, and less damaging, terminology. In particular the new theory abandons entirely Meinong's use of the term 'being'. But many of the things said using this term can be said in a noncommittal way. Consider objectives (i.e. states of affairs, of circumstances): instead of saying that objectives have being or not, it is enough to say, as Meinong sometimes did, that objectives obtain or not, a matter of whether corresponding propositions are true or not. Consider abstract objects such as numbers: Meinong maintained that though the number two does not exist it has being. On the new theory of number two neither exists nor is assigned being of any sort; however it does have properties, it has indeed a nature. These shifts - which are not merely terminological since a translation would mirror all properties, while the shifts do not - have a considerable payoff.[2] To begin with, the charge of platonism that has been repeatedly levelled at Meinong's theory, but which Meinong rejected, is more easily avoided. For example, Lambert suggests (73, p.225) that it is a verbal illusion to suppose that Meinong has clarified or settled the platonism-nominalism issue: 'in Meinongian terms, what the platonist asserts and the nominalist denies is that the number two has being of any kind.' In this sense the theory of items is nominalistic, for the number two has no being of any kind; even so it is an object and can be talked about, irrespective of (what is unlikely) any reduction of the talk to talk about the numeral 'two'. Meinong's theory, so reexpressed, removes the assumptions upon which the platonism-nominalism issue is premissed: it is no verbal illusion, then, that the theory clarifies, and indeed dissolves, the main issue. What remains is an issue concerning notational economy.

---

[1] A fuller account of differences between the theory of items and Meinong's theory of objects will be given in subsequent essays, especially 12.2.

[2] We shall encounter many other examples of how the reorientation of Meinong's theoy of objects pays off. We shall see, for instance, how the shift will enable the avoidance of the difficulties of Meinong's doctrines of the modal moment and some of the problems that are supposed to arise with regard to Meinong's notion of indifference of being (cf. Lambert's discussion 73, pp.224-5).

Like most undercurrents which threaten or upset the ideological status quo - in this case a prevailing empiricism, with philosophical rivalry cosily restricted to apparently diverse forms of empiricism, such as idealism, pragmatism, realism and dialectical materialism, the differences between which, like the differences between capitalism and state socialism, are much exaggerated - noneism has been subject to extensive distortion, misrepresentation, and ridicule (and even to suppression), and its logic has been written off as deviant. In particular, as we have already noticed, Meinong's theory of objects has been, and continues to be, the target for a barrage of supposedly devastating criticism and ridicule, which is without much parallel in modern philosophy, so that even to mention Meinong's theory gives rise to amusement, and practically any theory can be condemned by being associated with Meinong (as, e.g., 'shades of Meinong!' Ryle, 71, p.234, 'the horrors of Meinong's jungle', 'Meinong's jungle of subsistence' Kneale 49, pp. 32 and 12, 'the unspeakable Meinong' James cited in Passmore 57, p.187). And the literature abounds with allegedly final refutations of Meinong's theory (thus, e.g. Ryle 73, '*Gegenstandstheorie* is dead, buried and not going to be resurrected'), and with allegedly fatal objections to it, to any similar theory, and to any theory of impossible objects. It would not be difficult to make a busy academic career from replying to objections to the theory of objects.

The first moves in discrediting noneist (or Meinongian) theories are commonly superficially harmless-looking, but in fact quite insidious, terminological shifts. In particular Meinong's objects are called *entities*, thereby writing in the assumption that they all exist in some way (since 'entity' now means according to OED, 'thing that has real existence', a sense also strongly suggested by the derivation of the term), and preparing the ground for the classification of Meinong's theory as an extreme form of platonism. Because Meinong's theory is so commonly misconstrued as a platonistic or subsistence theory it needs emphasising once more that the widespread practice of calling Meinong's objects 'entities' is extremely misleading, and that of insisting that the objects all exist or at least subsist or have being, is mistaken; for Meinong explicitly denies that all his objects subsist or 'have being'[1]. Often, in the attempt to avoid misconstrual we shall use the neutral expression 'item' which parallels Meinong's use of 'object'. 'Item' is introduced as an ontologically neutral term: *it is intended to carry no ontological, existential, or referential* commitment whatsoever. In particular then, talk of items carries no commitment to, and should be sharply distinguished from, the *subsistence* of items; for 'subsists' means, in the relevant senses, 'exists, in some weak or low grade way'. Impossibilia not only do not exist or subsist; they are not possible.

A theory of items - which is what noneism aims at - is a very general theory of all items whatsoever, of those that are intensional and those that are not, of those that exist and those that do not, of those that are possible and those that are not, of those that are paradoxical or defective and those that are not, of those that are significant or absurd and those that are not; it is a theory of the logic and properties and kinds of properties of all these items. Items are of many sorts: a preliminary classification is worthwhile, even if it turns on such treacherous notions, to be looked at only much later, as individual and universal. Some items are individual, and some are not but are universal. Individual items are particular, whereas universals, which are abstract items, relate to classes of particular items. None of these familiar distinctions will bear too much weight. Future individuals and nonexistent individuals are often not fully specific and have much in common with certain universals, especially individual universals (as they might well be called) such as the Bicycle, the Horse, the Aeroplane, the Triangle and so on. Individual universals however have much in common with nonexistent individuals, thereby smudging the distinction in the other direction. (Consider, e.g. the differences between Meinong's round square, an individual, and the Round Square, the individual universal). Other preliminary classifications of objects run into similar or worse problems. Consider, for instance, Meinong's classification of objects into those of lower and higher order, a classification with much in common with the distinction between first and higher orders in modern logic. The modern logical account offers no serious characterisation of individual, and any object whatever can be included (as we shall see) in a domain of "individuals": a first-order theory can apply to objects of any order at all, and its only major drawback from this point of view is that it fails to give as full an account as it might of the logical behaviour of objects of higher order, e.g. of the linkage of properties (which are individuals, in the wide sense of singular quantifiable items) and predicates, of propositions and the sentences that yield them, and so on. Meinong's distinction of objects into lower and higher order may, at first sight, seem rather more promising: a higher order object is one which involves, or is about, an object. A proposition is thus a higher order object, because propositions are always about objects; but Meinong is a lower order object because, presumably, not involving any other object. But the distinction is not properly invariant under change of terminological characterisation, and repairing it would appear to lead to an obnoxious form of atomism. Thus neither The Triangle nor Triangularity involve, in any direct way, other objects, though both connect (in a way that more than 2000 years of philosophy has sought to explicate) with individual objects. And Meinong, since identical with the author of Uber Annahmen, does involve another object, namely, at least under the contingent identification, Uber Annahmen. It might be argued, in the style of Wittgenstein's Tractatus 47 and many earlier works, that there must be particulars, for such are fundamental as starting points; and out of these building blocks higher order objects are constructed. Appealing as this sort of picture may be, its charm begins to fade when the character (or, more accurately, characterlessness) of the particulars emerging is discerned. And the fact is that unless a narrow preferred notation is insisted upon there will commonly be a circle of dependence. Nor can recent accounts, given in the literature, simply be taken over. The fact that many particulars do not exist, do not have good spatio-temporal locations, and so on, means that a good many of the proposed accounts of particulars, e.g. those of Strawson 59, make assumptions which the theory of items rejects.

---

[1] This is clear from many points in Meinong's works. See, e.g., Findlay 63, pp. xi and 45-7 and references there cited. Cf also Chisholm (67, p.261):

> This doctrine of *Aussersein* - of the independence of *Sosein* from *Sein* - is sometimes misinterpreted by saying that it involves recourse to a third type of being in addition to existence and subsistence. Meinong's point, however, is that such objects as the round square have no type of being at all; they are "homeless objects", to be found not even in Plato's heaven.

There remains a distinction, yet to be made out satisfactorily then, between particulars and non-particulars, the latter including all abstractions such as universals of one kind or another, attributes, classes, propositions, objectives, states of affairs, etc. In terms of this conventional distinction, which will be adopted for the time being, individuals and lower order objects are particulars, the rest are higher order objects.

None but particulars exist, and by no means all of these do. Particulars, i.e. particular items, accordingly divide into entities, those which exist at some time, and non-entities, those which do not exist at any time, and non-entities divide into possibilia, those which are logically possible, and impossibilia, those which are logically impossible. The rival terminology under which 'possibilium' means 'mere possibilium or entity' is not adopted. Sometime entities divide into those which are currently actual, real or actual entities or things, and those, like Socrates and the most polluted ocean in the twenty first century, which are merely temporally possible and do not now exist.

Making these distinctions out - for example, what distinguishes entities logically from possibilia? Are possibilia those items that can consistently exist and, if not, why not, and how do these things differ? - and discerning the distinctive logical principles, if any, for these distinct classes of items - for instance which logical principles hold for impossibilia, and in particular does the law of non-contradiction hold in any form? - furnishes much further material for the theory of items to operate upon.

It may be granted that these sorts of distinctions can be made, and the rather scholastic problems so far outlined investigated. But why do so? Why try to rehabilitate Meinong's theory of objects?

§1. The point of the enterprise and the philosophical value of a theory of objects.[1] Though the reasons for trying to further the theory of objects are many and varied, there are some overarching reasons. There is simply no adequate theory of items that do not exist, or of non-actual items. Since so much of philosophy and of abstract and theoretical disciplines are concerned with such, devising an adequate theory is of the utmost philosophical importance. And only along the lines of a theory of objects can an adequate theory be reached. Likewise there is no satisfactory theory of intensional phenomena and intensional items. A theory along the lines of a theory of objects can provide a satisfactory theory of these things, but no theory falling short of such a comprehensive treatment of objects can do so. Consequently only through such a theory can an adequate theory of discourse and logic of discourse be obtained; for such a theory must account for the matters earlier cited, abstract objects and intensional phenomena. Apart from these large topics, there are connected or lesser things that a theory of objects is good for. We begin by spelling out some of these things, both large and small, in a little more detail: making good the claims will however occupy all of what follows, and more.

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[1] Dene Barnett insisted, back in the mid-sixties, that a section should be written making as clear as possible the point, and fruitfulness, of a theory of objects. The importance and fruitfulness of the enterprise was, of course, long ago explained and illustrated by Meinong and his disciples Ameseder and Mally: see especially essays in Untersuchungen zur Gegenstandstheorie und Psychologie, ed. by A. Meinong, Leipzig (1904). A translation of Meinong's essay from this volume appears under the title 'The theory of objects' in Realism and the Background of Phenomenology, edited by R. M. Chisholm, Illinois (1960), pp. 76-117. Even so many of the main, and now important, points remain rather inaccessible or less than clear or simply undeveloped.

First, and of major importance, the theory of items forges keys which properly used will open most doors and vaults in the fortress of intensionality, a fortress which has proved largely impregnable to empiricist and to classical logical assaults. Why is intensionality important? The overwhelming part of everyday, and also of extraordinary, of scientific and of technical discourse is intensional. Even superficial surveys of the published and spoken word will confirm this claim: work through a few columns of a newspaper or magazine or a literary or scientific journal, or even through a paper or two of our extensional friends, and see for yourself. If such philosophically important matters as truth and meaning are to be illuminated, claims made using such intensional discourse will have to be accounted for: a theory of intensionality will have to be devised. The need for such a theory becomes especially evident from the important programs of analysing philosophically important discourse and working out a more comprehensive logic of discourse. But it is also vital for the less ambitious task of making some limited progress on philosophical problems or obtaining some limited philosophical illumination: for most philosophical problems are intensionally set and will have to be solved or dissolved in the same setting.

Only a small beginning is made in what follows in showing how the theory of items helps with all these things: most of the effort will go into developing the theory to a point where it can be applied to some of these things. Some of the more specific things the theory can accomplish fairly directly are however worth recording.

The theory of items affords a sound basis on which quantified intensional logics, and more generally intensional logics with variable-binding devices, can be erected. For a major obstacle to the erection of such theories, has been, or at least seemed to be, the problem of quantifying into intensional sentence frames, i.e. of binding from outside variables covered by intensional functors. The trouble for orthodox positions is that the (nonclassical) objects these variables certainly appear to range over sometimes do not exist and generally are not fully determinate: they are incomplete (as, e.g., an arbitrary communist, an average philosopher) and may even be inconsistent (as, e.g., a square circle) in their properties. Accordingly such nonclassical objects are not in general accessible to the quantifiers and variable-binding operators of orthodox logics, e.g. classical theories, these operators being restricted to a domain of objects which exist, which are consistent and complete in all extensional respects, and which are determinate as to number and identity. Such nonclassical objects the theory of items, however, easily includes in its domain of items. Thus the theory provides an agreeably elementary solution to the problem of binding variables within intensional sentence contexts. The solution, which will be set out in more detail in what follows, has two main parts, designed to cope with two sets of difficulties: existence puzzles and identity puzzles. The existence puzzles are rather automatically solved simply by the admission as (object) values of variables of items which do not exist. Solving the identity puzzles is a matter of including in the theory of items an appropriate identity theory (such a theory is outlined in section IV).

The limitation of classical quantificational apparatus is just one reason why very many everyday sentences and many sentences figuring in philosophical argumentation which contain intensional expressions, are not amenable to formalisation at all, or else are not satisfactorily symbolisable, within classical logics or classical theories. Consider such examples as: A ghost is a disembodied spirit; the building resembles the sea-monster Godzilla; or (α) Ponce de Leon was looking for something, for the fountain of youth;

(β) The chief of the FBI is looking for a Communist;

(γ) Some people don't believe in any of Meinong's nonexistent objects;

(δ) An actual person sometimes wants something that doesn't exist;

(ε) My favourite fictional character is thinking about something which can't exist; namely a round square;

(ζ) Tom Jones knows not just that some thing doesn't exist, but of some thing that doesn't exist;

(η) Some mathematicians mistakenly believe that every consistent item exists.

(μ) A cyclone, code-named Thales, is expected to form over the Coral Sea tomorrow.

The fact that such sentences, and indeed very many other sentences, from metaphysics, from epistemology, and from ethics, for example, cannot be adequately formalised in classical logic has the serious consequence that classical logic cannot be used to assess the validity of many philosophical arguments in central areas of concern such as metaphysics, ethics, and epistemology. Such sentences can however be satisfactorily symbolised using neutral quantifiers and descriptors (not restricted by existence and identity fiats) and coupling expressions which do not carry existential loading; and such expressions and quantifiers the logic of a full theory of items would supply. Many statements and theses of major philosophical interest can then be formally represented, their consequences investigated logically, and the theses to this extent assessed. If just for this reason a theory of items demands philosophical attention.

Among philosophical positions beyond the scope of classical formalisation and classical logical assessment are the noneist positions of Reid, Meinong, and the Epicureans which introduced this essay. But there are many other positions besides noneist ones which elude classical formalisation and assessment, for example those of the dialecticians and of the nihilists (as DCL and NNL explain), not to mention the arguments of the sophists and much of traditional logic: indeed it is perhaps not going too far to suggest that most important philosophical theories, not excluding those of modern exponents of and apologists for classical logic, lie beyond the scope of classical formalisation and assessment.

A theory of items even has its advantages as a basis for recent revolutionary, but atheist-like and bizarre, religious positions which consider God as a nonentity; for them God can, at any rate logically be considered as a distinguished and worship-worthy nonentity among other nonentities. Seriously, however, an ontologically neutral logic, unlike classical logics, offers a basis on which various religious positions - which do make quantificational claims concerning God or gods - can be reformulated and formally assessed by an atheist.

The theory of items is good not merely for the formalisation and technical assessment of philosophical theses and positions, it is also of great value in resolving a variety of traditional philosophical puzzles concerned with intensionality and, what intensionality so often involves, non-existence. It copes directly, for example, with the ancient riddle of non-being, of how one can say of what does not exist that it does not exist, and, unlike Russell's theory which deals only with particular cases, it allows quantificational claims to be made, e.g. because Pegasus does not exist [$\sim E(g)$] some items do not exist [$(Px)\sim E(x)$], and so on. Less directly, the theory of items can cope with such traditional puzzles as that of fatalism, of the third man, and as to how things can come to exist and pass away, i.e. with puzzles of time change.

More generally, wherever features of intensionality are philosophically important, the theory of items can make a major contribution: one example developed in detail subsequently is the case of perception, but there are many other examples, which the case of consent will illustrate. Consent is intensional both in that one may consent to what never does exist (or indeed cannot exist) and in its opacity; for one can consent to ϕing with x but not consent to ϕing with y though y is in fact identical with x. A direct account of the logic of consent, and a straightforward analysis of consent, are matters which the theory of items can handle but which rival theories cannot.

Philosophical difficulties concerning the interpretation of quantifiers in chronological logic closely resemble those in intensional logic and can likewise be resolved in a theory of items. Quantificational tense logics which eschew versions of the false sempiternal hypothesis, according to which if a thing exists at some time it exists at all times [symbolised $((x).(Pt)E(x;t) \supset (t)E(x;t))$], and in which the equally faulty tensed Barcan formula [symbolised $(\exists t)(\exists x)f(x;t) \supset (\exists x)(\exists t)f(x;t)$] is rejected, can readily be constructed using ontologically neutral expressions and quantifiers (on the principles rejected, and their appeal, see Prior 57). In fact it is almost sufficient to transform n-place predicates, such as '$f(x_1,\ldots,x_n)$', into (n+1)-place predicates, such as '$f(x_1, \ldots,x_n;t)$', and to extend neutral quantification logic to include time variables, t, $t_1\ldots$, as well as object variables. A more elaborate Newtonian tense logic can however be reached by adding the predicate constant '$\leqslant$', read 'precedes or is simultaneous with', and appropriate time-ordering postulates on it (see part II); then by varying the conditions imposed on $\leqslant$ the usual tense logics can be recovered. For all these reasons the theory of items offers a suitable, and worthwhile, foundation for quantified chronological logics.

The theory of items plays a more fundamental role in semantics than has so far been revealed in indicating how the theory reinterprets quantified classical logic and chronological logic to advantage. Normal semantics for intensional logics require quantification over situations or worlds beyond the actual, possible worlds, and for richer systems, incomplete worlds and impossible worlds as well. It is evident enough that such worlds are just further sorts of nonexistent objects, and indeed they function exactly like objects in the more formal semantical theory. The worlds have however caused severe metaphysical difficulties for standard logical positions, irrationally committed to the thesis that whatever is talked about, at least quantificationally, somehow exists. The result has been a situation like that regarding universals: the rejection of the semantics as not making sense, or some such, by the nominalistically-inclined, and attempted vindications of the semantics along conceptualist and realist lines, the latter sometimes taking such extravagant forms as a revival, in effect, of Democritus's theory of alternative existing universes. But, as in the case of universals, each of the three (classes of) positions rests on a mistaken assumption, which the theory of items avoids. Since the theory allows quantification talk of what does not exist, such as the worlds of semantics, it can furthermore erect on the basis of such semantical analyses ontologically neutral theories of truth and of meaning, which contain however no commitment to the existence of universals such as meanings (for details of such a construction see MTD).

The theory of items provides an alternative position on universals to any of the standard positions and, dare we claim it, a far more satisfactory position. In particular, it provides a way of avoiding platonism and its existential commitments without abandoning talk of abstract items such as attributes and numbers. Platonisms are committed to the existence, or at least to the subsistence, of universals: noneism is not. Routes to platonism are cut by abandoning key premisses employed in reaching platonism, for example

(pi) Only that which is real or actual can have properties (a version of the Ontological Assumption), and

(pii) The Non-existent, and non-existent items, cannot be sensibly spoken about or discussed.[1]

On the contrary, according to noneist principles, nonentities such as universals can have definite properties; and discourse about universals can continue without commitment thereby to the existence of universals. This dissolves, in a shockingly elementary way, the main difficulty in the traditional problem of universals (but really it was a cluster of problems). Noneism has other important consequences (some of which, such as the way in which noneism enables a synthesis of standard positions on universals, will be drawn out subsequently). For one thing, given a formal theory of items various criteria for the existence of such items as universals can be symbolised, compared, assessed and, should they allow that any universals do exist, found wanting.[2] Consequently, too, a theory of items is especially important for the development of nominalisms which, like the nnominalism or noneist nominalism to be outlined, are not tied to the thesis: everything (in the universe of discourse) exists. For such nominalisms classical mathematics, including analysis and the theory of transfinite classes, is, after rephrasing, nominalistically admissible, provided that the quantifiers used in the rephrased formalisation do not carry existential commitment.[3] In contrast, classical mathematics as usually presented, with its staggering array of logically established existence theorems, is riddled with platonism, and is (n)nominalistically quite inadmissible.

As a further consequence, a logicist theory of mathematics can be developed without a heavy platonistic bias. For, contrary to popular preconceptions, logicism can be combined with nnominalism. By logicism is meant, as usual, the theory centered on the theses:

(li) For some logical system S the substance of classical mathematics is reducible to S;

(lii) The statements of pure mathematics are analytic.

A logicist reduction of mathematics to an existence-free logic - thereby avoiding contingent existential statements - was supported by Russell himself in 19 (p.203, footnote). By taking the substance of classical mathematics to consist of a consistent subtheory of the pre-1911 theory rephrased with neutral quantifiers, the reduction relation in (1i) as one of necessary (or strict) identity (as elaborated in IV below), and the analyticity property of (1ii) as logical necessity of S5 strength, many objections to logicism are swept away.

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[1] Cf. Parmenides' self-refuting claim 'it is neither expressible nor thinkable that What-Is-Not Is' in Freeman 47, p.43, and much subsequent literature from Plato's dialogues on - until Russell 05.

[2] For a beginning on the assessment of criteria for the existence of properties, see NE.

[3] The quantifiers concerned are studied in SE, NE and Slog.

Furthermore certain axioms usually thought to raise problems for logicism prove dispensable or innocuous when logicism is coupled with the thesis that mathematics is part of the theory of items. For instance, the axiom of infinity is only needed in the weak form: for some consistent class c, c is infinite (e.g. noninductive). Not only is there not much doubt that such a result holds as a matter of logical necessity,[1] but further such a result is provable given a suitable logical basis.[2]

Several other problems in the philosophy of mathematics can be given attractive solutions once mathematics is recognised as a special discipline within the theory of items. How mathematical theories can treat of seventeen dimensional spaces, of ideal points and masses, and of transfinite cardinals is readily explained: these theories treat of nonentities. Just as there is no problem of mathematical existence, so there is no problem of mathematical entities, as there are none. But mathematical items there are without limit, and their features, their incompleteness, their variety, are of much concern to noneists.

Then too an explanation can be given of how various mathematical theories which treat of ideal items manage to apply, e.g. to apply to the real world. In many applied mathematical problems, nonentities, which considerably simplify, and so render mathematically tractable, the entities they approximate in relevant respects, are introduced. Then the mathematical theory which treats of nonentities or ideal items can be applied, essentially as a logical juice extractor,[3] to yield more information about the items, and applied mathematical results are finally obtained by transferring back from the nonentities to the relevantly analogous entities. In replacing a problem by an analogous one for suitable simple nonentities, infinitely complex entities are typically replaced by finitely-specifiable regular nonentities, which are mathematically tractable and manipulable. Items of applied mathematical models are nonentities, which have just the desired properties (e.g. mass, position, velocity, size, elasticity) and no more (e.g. no determinate colour, origin, history). The loop taken through simplifying nonentities also helps to explain the point of many of the approximations made in applied mathematical problems. All this puts us on the road too, to explaining what is sometimes thought to be puzzling, how

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[1] For some arguments for this point see the defence of S5 as a system of logical modalities in IE. For a refutation of idealist doubts about the consistency of infinity see Russell 38. A more recent doubt comes from a confusion of (a) an infinite totality possibly exists, with (b) an infinite totality is consistent. For some items which are consistent cannot possibly exist: see NE. That infinite totalities are such items is suggested by a reading of Aristotle's Physics Book III, B. Whether or not this is so, doubts about (a) should not automatically transfer to doubts about (b).

[2] For example it is provable in a modified form of Quine's system ML where existential quantifiers are replaced by possibility quantifiers in the way indicated in SE. Lines of proof were indicated by Russell 38 and still earlier by R. Dedekind, Was sind und was sollen die Zahlen, 6th edition, Braunschweig, 1930.

(continued on next page)

nonentities can have an explanatory role. They have such an explanatory role not only as ideal objects in applied models, but in all the ways that theoretical abstractions can serve in the explanation of what actually happens. Such explanations are possible because explanation is an intensional relation which can relate what exists to what does not.

II. Basic theses and their prima facie defence.

Attempts to write off discourse concerning what does not exist as somehow improper, or second grade, or even as nonsense or ill-formed, continue to have currency, and will continue to appeal as long as rude empiricism persists as an important philosophical option. For simple subject-predicate statements about what does not exist run afoul of what fuels empiricism, the verification principle (in its multiplicity of forms). What does not exist cannot be produced for empirical verification of its properties. Accordingly such "statements" have whatever defects the verification principle ascribes to unverifiable statements.

The first theses to be defended - according to which subject-predicate sentences ascribing properties to nonentities may be significant, and yield perfectly good, first-class statements - are designed to meet empiricist criticism which would destroy any theory of items before it gets off the ground. This is only part of a larger battle between empiricism and what the theory of items is really part of, rationalism. If the theory of items is correct there are ways of coming to know truths concerning, in particular, what does not exist which are not based, even ultimately, on sense perception; and so empiricism is false.[1]

A main, commonsense and anti-empiricist, thesis of the theory of items, reminiscent of Wittgenstein 53, is that very many ordinary and extraordinary statements about what does not exist are perfectly in order as they are, and not in need of reduction or eliminative analysis. Defence of such a thesis is bound to be somewhat piecemeal, showing that for each particular sort of way in which statements can be out of order, the statements concerned do not suffer from that sort of disorder. Unsubtle application of the verification principle would yield the result that such statements (i.e., in this sense, declarative sentences) are out of order because meaningless. The first of the preliminary theses, already presupposed in earlier discussion, oppose the charges of meaninglessness and truth-valuelessness.

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[2] (continuation from page 12)

Still more exciting are the prospects for paraconsistent noneist logic, where not only axioms of infinity but also axioms of choice can be proved (see UL), and where it may well be that inaccessibility axioms can be proved.

[3] The account is very different from instrumentalism, which certainly does not aim to explain the behaviour of what exists in terms of what does not, in terms of the physically ideal objects that make up the logical juice extractor.

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[1] Certainly in judgement form, but also, as further argument will reveal, in concept form. The way in which the theory of items serves to refute empiricism and to instate a new rationalism will be much elaborated in subsequent essays.

§2. *Significance and content theses.*

(I) Very many sentences the subjects of which do not refer to entities, e.g. 'the round square does not exist', 'Primecharlie (the first even prime greater than two) is prime', are significant. Furthermore the significance of sentences whose subjects are about (or purport to be about) singular items is independent of the existence, or possibility, of the items they are about. (The significance thesis).

Thus, for example, the significance of 'a is heavy' does not depend on whether or not a exists but only on whether 'a is a material item (is material)' is (unlimitedly) true.[1] Thus, since Kingfrance is a material item, 'Kingfrance is heavy' is significant irrespective of whether or not Kingfrance (i.e. the present king of France) exists. Likewise the sentences 'Kingfrance does not exist', 'James Bond believes that Kingfrance is a heavy man' and 'James Bond set out to find Kingfrance' are significant. Equally 'Kingfrance is prime' is non-significant whether or not Kingfrance exists; similarly 'Rapseq is witty' where 'Rapseq' names the least rapidly convergent sequence.

As arguments for thesis (I) are well-known, only a few arguments are set out in brief form. Significance is (in the first instance) a time-independent feature of (type) sentences; therefore if there was, is, or will be a time at which such sentences are significant the sentences are significant. For example, the sentence 'Kingfrance is wise' is significant because in earlier times, e.g. in 1453, the sentence would be used to make a genuine statement. Significance is a context-independent feature of sentences, a sense feature, not a denotational feature; therefore the significance of a sentence does not depend on such contingent context-dependent matters as whether a subject does have an actual reference. Thus the significance of a sentence is independent of whether in a given context its subjects have actual references, and of whether or not it expresses a truth. Indeed some statements about singular individual items are true or false because the items do not or cannot exist. But for the statements to have a truth-value the sentences which express them must be significant. More generally, the significance of a sentence is a necessary condition for it to express a statement of any sort, consistent or inconsistent, true or false. Hence whether or not the subject of a sentence exists does not affect the significance of sentences in which the subject appears. Hence too it is invalid to argue from inconsistency to non-significance.

A somewhat more subtle empiricist approach attempts to remove assertions about what does not exist from the main and serious scene of logic and philosophical investigation, as not really statements, as not truth-valued assertions at all, as less than serious assertions (like that to a bachelor, 'So you've stopped beating your wife') whose truth or falsity doesn't arise. The facts of discourse are quite different.

(II) Many different sorts of statements about non-existent items, including many of those yielded by single subject-predicate sentences, are truth-valued, i.e. have truth-values true or false.[2] Hence, in particular, many declarative sentences containing subjects which are about nonentities yield statements in their contexts. More generally, many sentences about nonentities have content-values in their contexts. (The content thesis).

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[1] As ST explains. Significance here is context-independent significance, as contrasted with nonabsurdity of Slog.

[2] Or if need be, should bivalence fail, true and not-true.

For example, such declarative sentences as 'Rapseq does not exist', 'Hume's golden mountain is golden', 'K believes that the present king of France is of the House of Orleans' are statement-capable in many, and normal, contexts and have truth-values and other content-values. Thus, for instance, the sentence 'Rapseq does not exist' yields in intended contexts a statement which is analytic, and so true.

About many such statements there is, and is room for, but little dispute. Among such statements are those expressed by sentences of the form af, where 'a' is about a non-entity and 'f' is an ontic predicate such as 'exists', 'does not exist', 'is fictional', 'is imaginary', 'is impossible'. It is not in much dispute, for instance, that "Meinong's round square is a possible object" is false and that "the present king of France does not exist" (or, more idiomatically, "there exists no present king of France") is true. A perfectly respectable mathematical argument may conclude: Therefore Rapseq does not exist. Nor is it really in dispute that logical truths are not upset by non-existence. Whether or not the king of France exists, the statement "The king of France is wise and the king of France is not wise" is false. Even if the statement "The king of France is wise" is not truth-valued, it manages to respect logical laws (this fact tells against simple many-valued approaches to the logics of truth-value gaps). Nor is it in dispute that many intensional statements (purportedly) about non-existent objects are truth-valued, e.g. "Ponce de Leon sought the fountain of youth", "Z thinks the fountain of youth is in Ruritania", and "K believes the present King of France is wise". The fact that thesis (II) is not in dispute concerning all these types of cases has a substantial bearing on cases where it is in dispute, e.g. as regards whether such statements as "The fountain of youth is in Ruritania" and "The present king of France is wise" are truth-valued. For, to put the point semantically, there are worlds or situations, such as those of Z's thoughts or K's beliefs, where the question of the truth-values of statements whose truth-values are said not to arise do arise.

The main disputed cases of the philosophical literature take the form af, where 'a' is a description (such as 'the present King of France') or a descriptive name (such as 'Kingfrance') of a nonentity and 'f' is an extensional (and usually empirical) predicate such as 'is tall', 'is bald' or 'is wise'. One of the main logical issues separating Russell (and others) from Strawson (and Geach and others) was as to the falsity or otherwise of such statements as the "The king of France is wise", Strawson maintaining that the truth or falsity of such statements does not arise, that there are (as Quine was later to put it) in the case of such statements, truth-value gaps. Strawson's evidence for his claim was, it now appears in retrospect, remarkably flimsy. The case was allegedly based, predominantly, on ordinary usage, on what it was supposed you, ordinary language user,[1] would say when

> someone were in fact to say to you with a perfectly serious air: 'The king of France is wise'. Would you say 'That's untrue'? I think it is quite certain you would not. But suppose he went on to ask you

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[1]
> I think it is true to say that Russell's Theory of Descriptions ... is still widely accepted among logicians as giving a correct account of the use of such expressions (as definite descriptions) in ordinary language. I want to show ... that this theory, so regarded, is seriously mistaken (OR, p.163).

> whether you thought that what he had just said was true, or was false; whether you agreed or disagreed with what he had just said. I think that you would be inclined, with some hesitation, to say that you did not do either; that the question of whether his statement was true or false simply did not arise because there was no such person as the king of France (OR, pp.174-5).

That ordinary usage would deliver a clearcut verdict on values - hard data of the sort logical theories should acknowledge - in a context as unordinary as that of the example was hardly to be expected. And the fact is that many of us would not make the responses Strawson claims we would: Meinong would not, Russell would not, Carnap would not, and so on, for many others. But what of those uncorrupted by logical theory of one sort or another: perhaps most, or enough, of those would respond as Strawson suggests? Would they? Strawson's case was not, of course, supported by empirical or statistical surveys of what people actually do say. When evidence of that sort did come in, using the methods of Naess 53, it tended to support Russell rather than Strawson; it told against truth-value gaps, and undercut Strawson's certainties about what one would say. Subsequently (in 64, p.104) Strawson substantially weakened his claim that ordinary usage supported the truth-value gap theory as opposed to the truth-valued theory:

> ... ordinary usage does not deliver a clear verdict for one party or the other. Why should it? The interests which ordinary usage reflects are too complicated and various for it to provide overwhelming support for either way of simplifying the picture. ... Instead of trying to demonstrate that one is quite right and the other quite wrong, it is more instructive to see how both are reasonable, how both represent different ways of being impressed by the facts.

Thus Strawson in effect abandons his main argument (of OR) against the truth-valued theory. Nor (as we shall shortly see) is the data as kind to the gap theory as is supposed: there are many cases, even exhibiting radical reference failure, where values are assigned, where it is not so reasonable to try to apply the gap theory.

Much of the rest[1] of Strawson's case relies on an assumption, shortly (in the next section) to be completely rejected, the Ontological Assumption. A (simple) sentence whose uniquely referring subjects fail to designate anything actual is

> neither true nor false any more than it is about some object; ... it will be used to make a true or false assertion only if the person using it is talking about something. If when he utters it, he is not talking about anything, then his use is not a genuine one, but a spurious or pseudo-use ... (OR, p.173).

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[1] Strawson, like others, also depends in his argument upon confusing failing to designate with designating a nonentity, and attributing curious features of the former to the latter. Strawson's restriction of quantifiers to existentially loaded ones, so that nothing amounts to nothing existent and anything to anything existent, of course encourages such confusion.

Strawson offers no argument for this positivistic writing-off of commonly occurring countercases to his claim, as spurious or pseudo-uses[1], or for the major assumption on which all this relies, the Ontological Assumption, that such a statement has a truth-value, and is about something, only if the subject does refer to an existent object - no argument, though the assumption is reiterated through his discussion in OR (see pp. 167, 173, 175, 176 (twice), 177 (several times), 188).

There are good, though not decisive, reasons for saying what many of us would say, and in support of (II). Statements about what does not exist behave in an entirely propositional fashion.[2] They can, firstly, be the object of propositional attitudes; what they convey can be believed and thought about and reasoned about. Secondly, they serve an important communicational role; they convey information, they have a content which can be variously expressed in different languages. Thirdly, they have a full inferential role: they figure in assumptions, implications, arguments, and entailment relations; they can be asserted and refuted; and so on.[3] But if they behave propositionally then they have propositional features, such as being truth-valued. For the propositional content expressed either holds in the actual situation or it does not, i.e. it is true or it is false. The argument given sneaks in, however, two-valued assumptions about the logic of propositions, assumptions which can be rejected. It may be said that, though the matter is propositional, the logic of propositions is not two-valued (but is, e.g. many-valued, supervaluational, etc.). Certainly logics of propositions which are not two-valued may be devised: logics of entailment, to be adopted subsequently, deliver such logics (and also show how such logics may be built from two-valued components, and a two-valued logic thus reintroduced as basic). The issue becomes, like so many philosophical issues, rather more a matter of which logic to choose to account for which data. The claim here - though not too much hangs on it, since the theory to be elaborated could be reworked on a three-valued basis with values: true (10), false (01) and neither (00); or, better, on a symmetrical four-valued basis with further value: both (11) - is that a two-valued propositional basis is much preferable to account for the data, not for reasons of simplicity and the like (though these are factors), but for the following reasons:-

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[1] In revised reprints of OR it is suggested, in some places at any rate, that talk of spurious uses be replaced by talk of secondary uses - as contrasted with talk of primary uses, which are alleged to conform to Strawson's theory. The move represents a typical piece of theory-saving: compare the Quinean strategy of dismissing the wealth of important discourse the canonical language cannot accommodate as second-grade discourse (or worse). The rich variety of counterexamples to the Ontological Assumption, including very many Sosein statements, are secondary in Strawson's sense.

Quite apart from the latent positivism, Strawson's methodology in OR leaves a lot to be desired. For example, the 'source of Russell's mistake' (p.172) is investigated before any solid evidence is adduced that a mistake has been made or that Russell made it. Much of the early part of OR is a guilt by allegation job.

[2] It is immaterial for the purpose of these arguments exactly which theory of propositions or contents is adopted: propositions could even be treated as certain ordered couples consisting of sentences, or equivalence classes of sentences, coupled with the relevant context.

[3] These reasons also support the significance thesis (I). For an elaboration of these sorts of points, and others, against Strawson's position see Nerlich 65.

Firstly, many statements of the type written off by truthvalueless accounts as not truth-valued are commonly assigned a truth-value. As Lambert remarks (72, p.42):

> ... it is counterintuitive to treat identities such as 'The teacher at Sleepy Hollow is Richard Nixon' as truthvalueless: it is plainly false.

Similarly statements such as "Richard Nixon is the present King of France", "The King of France is not human", "Phlogiston is a heat substance", "Pegasus is not a horse", "Sherlock Holmes is a detective" and "The man who can beat Tal doesn't exist" are truth-valued. And as van Fraassen remarks (66, p.490, also citing sources for the examples he gives),

> ... there certainly are sentences in which there occur nonreferring singular terms and to which we do assign a truth-value. Examples are: The ancient Greeks worshipped Zeus. Pegasus is to be conceived of as a horse. The wind prevented the greatest air disaster in history.[1]

At the very least then, truth-value gap theories are obliged to offer criteria distinguishing truth-valued and truthvalueless cases, criteria markedly different from those, such as containing a nonreferring subject, that have hitherto been suggested. But in fact logic should not have to wait, to get started, upon such criteria: if a uniform logic, without initial gaps, which reflects ordinary responses (as assessed, e.g. by questionaires like Naess's) and which is otherwise unproblematic, can be devised, so much the better.

Suppose however criteria are furnished (and thus one of the intermediate interpretations of van Fraassen 66, p.490 results): would we want to say that such assertions as "The king of France is bald" - an alleged paradigm of truthvalueless assertions - are not truth-valued? Many of us would not.[2] Consider the sort of assumptions that go into the claim that it is not truth-valued. It is assumed that the assertion is not about anything - anything actual, it should be said: for plainly enough it is about the king of France.[3] The semantical argument from reference failure to truth-value gaps is however based on the mistaken assumption, that such offending subjects as 'the king of France' are not about anything. Strawson, for example, states his newer case (64, p.116) for truth-value gaps as follows:-

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[1] At least the first two examples are however clearly intensional, and fall within the scope of earlier remarks. Such examples also create serious difficulties for Russellian-style theories.

[2] That some would is immaterial. There is substantial empirical evidence that not all of us adhere to the same logical principles and that semantical theories, where articulated, are even more diverse.

[3] It is evident that Strawson makes such an assumption, that in cases of reference failure the subject cannot be about anything. Thus, firstly,

> If we know of the reference failure, we know that the statement cannot really have the topic it is intended to have and hence cannot be assessed as putative information about that topic. It can be seen neither as correct, nor as incorrect, information about its topic (64, p.116)

> The statement or predication as a whole is true just in the case in which the predicate-term does in fact apply to (is in fact 'true of') the object which the subject-term (identifyingly) refers to. The statement or predication as a whole is false just in the case where the negation of the predicate-term applies to that object, i.e. the case where the predicate-term can be truthfully denied of that object. The case of radical reference failure on the part of the subject-term is of neither of these two kinds. It is the case of the truth-value gap.

Read as intended the account is inadequate; for it fails to give an intermediate position, but assigns such sentences as 'Pegasus is not a horse' as gap cases. Such a gap view is also implicit (as Strawson remarks) in Quine's succinct (but unduly narrow, since plural subjects are excluded) account of predication (WO, p.96):

> Predication joins a general term and a singular term to form a sentence that is true or false according as the general term is true or false of the object, if any, to which the singular term refers.

Now if the subject term is about an object which does not exist, no truth-value gaps remain. It will of course be objected that reference failure occurs just where the object (so to speak) does not exist, so no object is referred to. But the point wanted thereby emerges clearly enough, namely that the gap theory depends on the assumption that all objects exist. Given thesis M1, the semantical case for gap theories is voided. It will be protested also that in the absence of the king of France the usual empirical tests for baldness cannot be applied (cf. Lambert and van Fraassen 72, p.219 in their effort to 'try to take seriously the idea that in many cases statements about non-existents are really very puzzling'). But empirical tests are far from the only ones we commonly use in determining truth-values. Consider the king of France, and his features. Since nothing in the characterisation of the king implies, or inclines us to think (unless we make a mistaken identification), that he is bald, there is no basis for assigning truth-value true to the assertion.[1] That is, it is not true that the king of France is bald: about this there is comparatively little disagreement. Hence, by bivalence, it is false that the king of France is bald. But bivalence is what is at issue. It is an issue that can, in large measure, be avoided by operating with values true and not-true, and leaving the connections with value false open (though reasons are given in SL and RLR for closing the issue so as to ensure bivalence of significant assertions). For what matters, the logical behaviour of statements about nonentities, and the failure of the assumption that a statement about an item is not true unless the item exists, can be investigated rather independently of the falsehood issue. Nonetheless it does appear that the king of France, even if a very incomplete object, generates no gaps.[1] A first argument appeals, in effect, to Quine's account of predication which builds in bivalence: that the king of France is bald is true or false according as the predicate 'is bald' is true or false of the object, the king of France, i.e. according as the king of France is among the bald objects or not; but it must be in the class or not. A second argument runs from nontruth to falsehood. If it is not true that the king of France is bald, then it is not the case that the king has the property of baldness; so the king does not have the property of baldness; and so the king is not bald, that is (by a Tarski biconditional) it is true that the king is not bald, and hence it is false that the king is bald. The argument may, hardly necessary to say, be broken at several points, but at none very plausibly. Generalising the argument to assertions of the form af, there are no gaps.

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[1] The context is taken to be one - familiar enough to philosophers but often said by philosophers to be queer - of philosophical investigations; so that no further features accrue to the king of France than those his characterisation supplies. Even so (pace Crittenden 70, p.91) the statement "The king of France is bald" is not about nothing whatsoever, but about, what it seems to be about, the king of France. In a different context, e.g. that supplied by Steinbeck's novel Pippen IV which is about a contemporary king of France, truth-value assessment of such assertions as that the king is bald turns on further consideration, such as what features the story ascribes to the king.

Secondly, the leading features of truth-value gap accounts can be obtained by a cross-classification of statements in theories which avoid truth-value gaps. For example, the incompleteness and indeterminacy features of "Kingfrance is bald" - the features which, in a bumbling way, theories of truth-value gaps are really endeavouring to capture - emerge, as on Russell's theory, from the falsity of both "Kingfrance is bald" and "Kingfrance is not bald", these taken together revealing a gap in Kingfrance's properties. More generally, in a relevance logic framework, both truth-value gaps (incompleteness) and truth-value gluts (overcompleteness or overdetermination) can be defined in terms of truth-valued expressions: thus at each world a, A is incomplete at a, symbolised $IC(A, a) = 1$, iff $I(A, a) \neq 1 = I(A, a^{\dagger})$ i.e. iff A does not hold at a but holds at its image $a^{\dagger}$ (see RLR chapter 7).[2] In short, the advantages and philosophical point of a gap theory can be obtained without truth-value gaps: the gap theory is unnecessary as well as being an inferior way of handling the data, features of incompleteness. Moreover the disadvantages of gap theories are thereby avoided, e.g. the problem of assessing truth-valued compounds with components which lack a truth-value, e.g. ΦA where ΦA is truth-valued though A is not.

The serious gaps in the logics of gaps - e.g. the trouble with supervaluation methods that one cannot express in the logic that a statement has a gap-assignment, i.e. that its truth-value is not assigned or does not arise - will be brought out subsequently in discussing the logic of nonentities and free logics: so too will the perplexing asymmetry of the gap theories, that gaps should be allowed for but not gluts. For the moment it is enough to observe that if a satisfactory logic of gaps were produced, it could be superseded (by the methods of universal semantics, of ER) by a logic which translated its claim accurately and which also accorded with thesis (II).

The really important point is, however, not that alternatives, such as those of Strawson and successors,[3] to classical theories of descriptions violate thesis (II): if necessary noneism could be reexplained without reliance on thesis (II) in a logical frame allowing gap and gluts (see RLR). The important point is that noneism rejects the assumptions on which both the orthodox rivals, Russellian and Strawsonian accounts and their variants, are based: for the truth of af neither implies nor presupposes[1] that a exists. To assume it did would be to accept the Ontological Assumption, the rejection of which is a main thesis of noneism (part of M3). Insofar as the choice as to theories of descriptions has been presented as a choice between logical theories, such as Russell's, and non-formal theories, such as Strawson's, the choice is a false one based on a nonexhaustive dichotomy. There are other theories which reject the mistaken assumption, the Ontological Assumption, on which both Russellian and Strawsonian accounts are premissed. Thus the celebrated dispute between Russell and Strawson - a dispute centered around the correct formulation of the Ontological Assumption in the case of descriptions, over the relation of the true-value of af (with a a descriptive phrase) to the existence of a, as to whether one who asserts af asserts or logically implies aE or whether the truth-valuedness of af only presupposes aE - is a relatively minor one.[2] From the point of view of examining and questioning fundamental assumptions it is like taking the central issue of Christian religious conviction as being that of whether one should choose to be a catholic or a protestant, leaving unquestioned the fundamental assumptions of Christianity and ignoring the major issue as to whether one should be a believer at all.

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[1] The situation with the images of the paradox statements (e.g. "This statement is true", "The class of all self-membered classes is self-membered") may appear rather more testing for the theories without gaps. In fact it is not.

[2] The supervaluational methods of van Fraassen, and of Routley NE pp.279-80, discussed later also operate by assigning as if truth-values to all gaps in initial valuations; the gaps reappear in the overall valuations.

[3] Some of the successors will be considered briefly in Part III: but since they all incorporate the Ontological Assumption they are of pretty limited interest.

§3. *The Independence Thesis and rejection of the Ontological Assumption.*

Theses (I) and (II), though allowing that many sentences about nonentities make sense and are truth-valued, give no information about the truth value that they have, and are compatible with their all being false.[3] There is a very widespread assumption, implicit in most modern philosophical theories, which settles the truth-values of very many of these statements, namely the Ontological Assumption (abbreviated as OA), according to which no (genuine) statements about what does not exist are true. Alternatively, in a more careful formal mode formulation, the OA is the thesis that a non-denoting expression cannot be the proper subject of a true statement (where the proper subject contrasts with the apparent subject which is eliminated under analysis into logical or canonical form).

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[1] 'Presuppose' is introduced in ILT to take up the 'special or odd sense of 'imply'' of OR, p.175:

> To say 'The king of France is wise' is, in some sense of 'imply', to imply that there is a king of France.

A presupposes B iff the truth or falsity of A does not arise unless B is true, i.e. A is either true or false only if B is true (see ILT, p.175). Hence since af presupposes aE, according to the gap theory, af is not true unless a exists.

[2] For instance, Strawson accepts leading (and, as we shall see contentious) features of Russell's analysis considered merely, as Kleene 56 and others consider it, as providing truth conditions for a descriptive statement (OR, p.167 and p.174). Given that the theory of descriptions is presented, as many logic texts present it, as a biconditional eliminating descriptive phrases in favour of quantified ones - not as saying that to assert the claim involving the description is to assert the claim with the description eliminated (not something Russell usually claimed in any case, so that much of Strawson's attack, against the second thesis (2) of OR, p.174 is misdirected) - Strawson's main objections reduce simply to this objection (which has already been dealt with): that it is false that anyone uttering a sentence, such as 'The king of France is wise' with a non-referring subject, would be making a true or false assertion (i.e. to the rejection of second thesis (1), OR, p.174).

The commonality of the Russellian and Strawsonian accounts also emerges strikingly in Strawson 64 in what Strawson takes as uncontroversial and not in dispute - which includes claims that noneists would certainly dispute.

[3] All positive statements, that is. Naturally their negations, which are said not (really) to be about nonentities, will be true.

It is the rejection of the Ontological Assumption that makes a proper theory of items possible[1] and begins to mark such a genuinely nonexistential theory off from standard logical theories. According to the OA - to state the Assumption in a revealing way that exponents of the Assumption cannot (readily) avail themselves of - nonentities are featureless, only what exists can truly have properties. All standard logical theories are committed, usually through the theory of descriptions they incorporate, to some version of the Ontological Assumption. The assumption is found in an explicit form in the theory of descriptions of PM: according to theorem *14.21 all statements about items which do not exist are false; only about existent items can true statements be made. (Russell does allow a description which lacks a referent to occur secondarily in true statements, but such statements are not about the item, and do not yield "genuine" properties.) The theory of Hilbert-Bernays allows the introduction of descriptions only on the (rule) assumption that they have a referent i.e. that the items they describe exist; hence descriptions lacking reference cannot even be introduced, and we are precluded from making any statements, even false ones, about nonexistent items. Another favoured technique for excluding nonentities is the identification of all nonentities with some peculiar item which has few or no properties, such as 'the null entity' (e.g. Carnap 56 and Martin 43), or the null class (e.g. Frege 1892, and Quine in ML). In the latter case a nonentity such as Pegasus would have no properties other than such properties of the null class as having no members.

The incorporation of the Ontological Assumption (the 'common prejudice' Reid refers to) as a basic ingredient in all standard logical theories - and in all standard discussions of such philosophical problems as universals, the objects of perception, the nature of mathematical objects, etc. etc. - simply reflects its status as a virtually unquestioned philosophical dogma. Philosophers of almost[2] all persuasions seem to agree that statements whose (proper) subject terms do not have an actual reference somehow fail. But though these philosophers agree that such statements fail they disagree on how to characterise this failure. According to the strongest affirmation of the featurelessness of nonentities, that of the early Wittgenstein and of Parmenides, such statements are not just meaningless, they can't even be made or uttered; according to Plato such statements are nonsense; according to Strawson they are not truth-valued; and Russell, as well as standard logic, tells us that they are all false. The lowest common denominator of these pervasive positions is given by the following formulation of the Ontological Assumption: it is not true that nonentities ever have properties; it is not true that any nonentity has a genuine property.

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[1] Grossmann makes a similar point (74, p.50):

> Without the assumption that nonexistent objects have properties and stand in relations, it is safe to say, there could be no theory of objects - nor could there be, I might add, phenomenology.

But as regards his claim that the content-object distinction is a necessary precondition for the theory of objects -

> Without this distinction, I am convinced, there would be neither phenomenology nor a theory of objects (p.48) -

Grossmann is entirely mistaken. A theory of objects could be based on a direct realist theory of perception (somewhat like Reid's) which avoids, or even repudiates, the content-object distinction.

[2] The tiny (disparate) group of free logicians and noneists constitutes the main exceptions.

In stating the Ontological Assumption in this form we have transgressed the bounds of discourse permitted by some of the traditional positions discussed. Parmenides, for instance, might say that as an assertion about nonentities the Ontological Assumption itself cannot be uttered. But of course it can. In clarifying his claim he might go on to assert, with Plato, that the Ontological Assumption cannot be significantly asserted. However within weak but quite defensible significance logics (see Slog, chapter 5) the Ontological Assumption can be significantly formulated: 'not true' can be symbolised using the significance connective 'T', so defined that Tp has the same value as p when p takes value true or false and Tp has value false when p takes the value nonsignificant.

In contrast to the more restrictive significance formulations of Wittgenstein and Plato, the Ontological Assumption presented by Russell is not a significance thesis, but rather the thesis that what does not exist has no properties, that it is featureless. In formulating the Assumption in this general way, instead of exemplifying it for descriptions, we have also gone beyond the bounds of Russellian logic, and in fact used non-existential quantifiers.

Reexpressed as a meaning rule the Ontological Assumption requires that all (proper) subject terms of true statements must have actual reference. So expressed the Ontological Assumption again provides a lowest common denominator for a pervasive class of theories. For the disagreement of Parmenides, Plato, Russell and Strawson is not a disagreement over the correctness of this meaning rule - they all agree that all subject terms in true sentences must have actual reference - but rather a disagreement over how the violation of such meaning rules affects truth-value status. Thus the Parmenidean position takes the rule as like principles of physics, as literally impossible to violate, whereas Plato and also Wittgenstein (in 22) see violations of the rule as leading to meaninglessness; according to Frege (on one account of his views) and Strawson, however, statements may violate the rule only if they are not truth-valued, while according to Russell and mainstream modern logic all statements breaking the rule are false. What all these positions have in common, and what is important here, is the acceptance of the meaning rule itself, embodied in the Ontological Assumption. In these disputes about how to classify violations of the rule, the question of the correctness of the rule itself is completely overlooked. So for anyone who wishes to reject the rule itself as mistaken, the traditional and modern disputes, e.g. that between Strawson and Russell, are comparatively unimportant; the general question of the value status of non-referring assertions is based on a false assumption - the Ontological Assumption.

1.3 BASIC AND ADVANCED INDEPENDENCE THESES

The Ontological Assumption - and thereby all the positions alluded to - was explicitly repudiated by Meinong's and Mally's Independence Thesis, namely

(III) That an item has properties need not, and commonly does not, imply, or (pre)suppose[1], that it exists or has being. Thus statements ascribing features to nonentities may be used, and are used, without involving any existential or ontological commitment. (The basic independence thesis)

The Independence Thesis (IT), as historically formulated[2], has weaker and stronger forms, e.g. modal (possibility) forms as distinct from assertoric forms, and also conflates certain theses with the IT which it is important to separate, in particular

(i) the Advanced Independence Thesis (AIT), according to which nonentities (can and commonly do) have a more or less determinate nature[3] (thesis M3 of section I), and

(ii) the Characterisation Postulate (CP), according to which nonentities have their characterising properties (thesis M6 of section I).[4]

Even if the basic independence thesis holds, in virtue of nonentities having, for instance, significance and intensional features, this does not (as free logic models will show) guarantee the advanced thesis, AIT, or the characterisation postulate, CP.

Meinong's apparent vacillation in formulations of the Independence Thesis can be explained by seeing the principle as the denial of implications of the Ontological Assumption expressed in the following form:

> The truth of xf, or that x has characteristic λf, implies
> (or presupposes) that x exists (cf. 60, p.82, lines 2-4).

Meinong denies not just the strict implication, by asserting that nonentities can have features, but also the material implication, in asserting that nonentities do have properties.

The Ontological Assumption was not rejected by Meinong merely in the weak sense in which it is rejected in free logic where nonentities, though permitted to figure in true statements in a backdoor way through constants, are not values of subject variables, and so are not full logical subjects. What was implicit in the Independence Thesis for Meinong, and would follow given an appropriate account of property, was also the guarantee that nonentities could occur as genuine subjects in true statements and could occupy all subject roles; that is to say, nonentities are amenable to the normal range of logical operations such as quantification, description, instantiation and identification (e.g. for 'Pegasus' to count as a full logical subject the inference from 'Pegasus is winged' to 'something is winged' must hold good, and the identity 'Pegasus = Pegasus' must be true). Thus Meinong's Full Independence Thesis, that the ability to fill the full subject role in a true statement is unaffected by nonexistence, commits him in modern logical terms not merely to free logic but to a thoroughgoing non-existential logic. Thus too an essential corollary of Meinong's theory, for which he explicitly allowed, is the introduction of non-existential analogues of the usual existentially loaded operations, for example he allowed for and used the non-existential quantifiers, 'something' or 'for some object' and 'everything', which carry no commitment to the existence (or transparency) of the items they quantify over, as well as the usual existentially or referentially loaded quantifiers of the kind familiar from Russell's and Quine's theories. For wide or neutral quantifiers the characteristic thesis of free logic, that everything exists, fails since many objects do not exist.

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[1] (Pre)suppose is intended to cover logical relations such as contextual implication and also weaker relations than implication. With (pre)supposition theory as it has been expounded - by Strawson and others and by many linguists - there remain many logical troubles, e.g. it is never explained which predicates presuppositions hold for, and which not, what the logical properties of (pre)supposition are, how like an implication relation it is or whether it is more like an inference rule, how exactly it ties with the traditional idea of existential import, and so on.

[2] See, for example, Meinong 60, p.82.

[3] Having a nature requires (something more like) having a suitably rounded set of extensional properties. That the round square is thought of by someone, ascribes an intensional property to the round square, but contributes nothing toward assigning a nature of some sort to the round square.

[4] The confusion of these three theses persists in modern literature, e.g. Linsky 77, p.33.

It is important to distinguish the Independence Thesis, that the characterisability of an item is independent of its existence, from the stronger false thesis rejected by Meinong, that the non-existence of an item does not affect its nature, or that entities and nonentities may be exactly alike, e.g. to put it in extreme form, that one could have two items identical in all respects except the one existed and the other did not. The confusion of the Independence Thesis with this false doctrine has contributed to the view that Meinong took nonentities as subsisting. Nor does it follow from the Independence Thesis that there is no difference between the sorts of properties that entities and nonentities can have, or between the logical behaviour of entities and nonentities. What the Independence Thesis does claim is that the having of properties is not affected by existence, or alternatively, that the nonexistence of an item does not guarantee (and cannot be defined as) the failure to possess properties.[1] In view of it we can correctly attribute some properties to nonentities.

Meinong not only repudiates the assumptions - fundamental to standard theories of meaning and truth - that what does not exist or is not real has no properties, is featureless or cannot be truly or sensibly spoken about or discussed; he also rejects consistency forms of the assumptions such as that only what is possible can have properties or can be spoken about. All these assumptions are opposed by the central tenet of the independence principle, the thesis according to which nonentities, including impossibilia, sometimes do have definite properties, they are not featureless.

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[1] The relation of independence used is the, quite familiar, non-symmetrical relation, e.g. x may be independent of y financially without y's being independent of x.

In the stronger symmetrical sense of independence - where A is logically independent of B if and only if A does not entail B or the negation of B, and B does not entail A - Sosein is not independent of Sein. For, in particular, certain sorts of characteristics, e.g. being squound (square and round), entail nonexistence.

1.3 NONEXISTENTIAL DISCOURSE

All the independence theses depend for their viability on the occurrence in discourse of expressions, in particular subject expressions, free from existential loading. According to the theory of objects - in contrast to classical logical thinking - there are *two types of discourse*, existentially loaded discourse, and discourse free from existential loading. Although in many occurrences subjects of statements *do* carry existential loading, that is, they imply or presuppose that the items designated exist, quite often subjects do *not* carry existential loading - as, for example, when they occur in true assertions of nonexistence, when they occur within the scope of certain intensional functors, and when they occur in usual mathematical contexts, pretence or fictional contexts, and philosophical contexts (as examples will soon enough make evident).

> According to Meinong, the two statements "The round square is round" and "The mountain I am thinking of is golden" are true statements about nonexistent objects; they are *Sosein* and not *Sein* statements. The distinction between the two types of statements is most clearly put by saying that a *Sein* statement (for example, "John is angry") is an affirmative statement that can be existentially generalised upon (we may infer "There exists an x such that x is angry") and a Sosein statement is an affirmative statement that cannot be existentially generalised upon; despite the truth of "The mountain I am thinking of is golden", we may not infer "There exists an x such that I am thinking about x and x is golden" (Chisholm 67, p.261).

According to classical logical theory, by contrast, all statements are made up from atomic *Sein* statements: the atomic statement $a\psi$ (e.g. "a is red"), or more generally $(a_1 \ldots a \ldots a_n)\psi$, *always* implies, or presupposes, that a exists. On the theory there are really no *Sosein* statements, and the OA is always satisfied at bottom (i.e. after logical analysis). It is for this reason that Chisholm maintains that Russell's theory of descriptions is no refutation of Meinong, but 'merely presupposes that Meinong's doctrine is false'.

> According to Russell, a statement of the form "The thing that is F is G" may be paraphrased as "There exists an x such that x is F and x is G, and it is false that there exists a y such that y is F and y is not identical with x". If Meinong's true *Sosein* statements, above, are rewritten in this form, the result will be two *false* statements; hence Meinong could say that Russell's theory does not provide an adequate paraphrase (Chisholm 67, p.261 continued).

In fact Russell's theory *does not* provide an adequate paraphrase (as we will see in section III).

Meinong did not bring it out as sharply as he might that one and the same (type) sentence can yield, in different contexts, either a *Sein* of a *Sosein* statement. Consider, for instance,

(α) Phlogiston is a substance which accounts for combustion and oxidisation.

In one context, e.g. one explaining the phlogiston theory, the statement (α) yields is true, indeed necessarily true since phlogiston may be characterised in part in just that way. In another context, however, e.g. that of explaining what actually does account for combustion, (α) is false. That is, as a Sein statement, an existentially loaded statement, which supposes existence of phlogiston, (α), which we may represent as

(α^E) Phlogiston^E is a substance which accounts for combustion and oxidisation,

is false since phlogiston does not exist. There is one other important point which emerges, namely that existential loading is a contextual matter. In one context (α) yields a Sosein statement which is true, in another context it yields a Sein statement which is false. In some ways then, (α) resembles 'I am hot' or 'Sherlock Holmes lived in London', which in one context can be true, in others false.

In order to allow for both sorts of occurrences of subjects, those that carry existential loading and those that do not, and to make the differences explicit, singular expressions in example sentences and in symbolic expressions are assumed not to carry existential loading unless the loading is specifically shown. The familiar case where expressions do carry existential loading can be represented by superscripting component expressions which carry existential loading with 'E', where 'E' symbolises 'exists'. For example, the Cartesian argument

I^E think; therefore I exist

is admissible, but the argument with the premiss Descartes as sceptic had,

I think; therefore I exist,

is not. (Note that in 'I^E exist' the superscripting is redundant.) When context is taken up syntactically, superscripting can be eliminated in favour of specific mention of existence requirements by way of equivalences like (to use standard notation)

$$A(u^E) \equiv. A(u) \& E(u)$$

$$g((\iota^E x)f(x)) \equiv g((\iota x)(f(x) \& E(x))).$$

In this sort of way superscripted expressions can be defined for each logical context for which they are required.

In everyday discourse existential loading is by no means always required; many everyday statements are Sosein statements.[1] And existential loading, where it is presupposed, is often contextually indicated and not stated. But in going further, in dropping existential commitment in all symbolic contexts unless it is explicitly indicated, a shift is made from work-a-day language to a natural extension of it.

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[1] It is for this reason in particular that Linsky's (67, p.19) criticism of the Independence Thesis that 'it neglects ... the implication that in talking about objects ... we are talking about objects in the real world' is mistaken. With Sosein statements there is no implication that what we are talking about exists; rather such a contextual implication is a feature of Sein statements. The expression 'objects in the real world' is itself ambiguous. For the domain of objects d(T) of the real world T of semantical analysis includes objects which do not exist: only a subclass of its objects, those of domain d(G) of the real empirical world G, exist. For further explanation of the ambiguity see §17.

The converse procedure of starting with existentially loaded expressions and then introducing by definition expressions which do not carry ontological loading, ontologically neutral expressions, appears to be impossible. At least if it is to be achieved without prejudging or prejudicing the content-value of certain expressions it appears impossible.[1] Russell's theory of descriptions cannot be viewed as a satisfactory attempt to introduce ontologically neutral expressions. For first the theory has to make exceptions for the ontological predicate 'exists' and does not cater at all for other ontological predicates such as 'is possible'. Second, the procedure does, as we have already noticed, prejudge the truth-values of sentences which contain expressions purportedly referring to nonentities. At least where intensional functors appear in these sentences (as in 'The mountain I am thinking of is golden' and 'Weingartner believes the winged horse is winged') the procedure too often assigns the intuitively wrong truth-value, even allowing for scope artifices. Third, ontological commitment is not eliminated but merely transferred to quantifiers. Under the theory descriptions are only eliminated by way of logically proper names: but logically proper names carry, by their very definition, existential loading.

Existential loading is carried in English chiefly by subject expressions. (Hence the attempts by logicians in the Russellian tradition to eliminate refractory designating expressions through predicates, e.g. 'Pegasus' by 'Pegasizes', 'Venus' by 'is Venus'.) But certain predicates and quantifiers such as 'exists', 'there exists' (and 'there are' in some occurrences) are used explicitly to state existential loading.[2] These predicates and quantifiers occupy a special position. They are not assumed, even in examples and symbolism, not to state existential loading. In fact their symbolic correlates are deployed just to specify existential status.

§4. *Defence of the Independence Thesis*. The Independence Thesis, that items can and do have definite properties even though nonentities, is supported by a wide range of examples of nonentities to which definite properties are attributed. These attributions occur when people make true statements about items, and therefore ascribe properties to them, without assuming them to exist or knowing full well that they do not exist. These examples represent counterexamples to the Ontological Assumption, unless a successful reduction of the example statements to statements about entities is produced. They therefore provide a prima facie case against the Ontological Assumption.

Many examples of correct ascriptions of properties to nonentities occur in mathematics and in theoretical sciences (cf. Meinong, 60 p.98 ff.) It is worth remembering that Meinong thought that mathematics was an important part, and the most developed part, of the theory of objects.[3] All of pure mathematics

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[1] The case argued in subsequent essays implies that it is impossible: see especially 'The importance of not existing'.

[2] Another set states its removal, e.g. verbs such as 'is dead', 'is not yet created', 'is impossible', 'is illusory' 'is imaginary' and 'has disappeared'.

[3] The sheer importance of mathematics and the theoretical sciences and the apparent relevance of nonentities to these subjects is enough to shake some of Findlay's objections to nonentities and to Meinong's theory of objects: for these see Findlay 63, p.56ff. Findlay makes no distinctions between nonentities with regard to their precision of characterisation or importance,

(footnote continued on next page)

and much of theoretical science lie beyond the boundaries of the actual.[1] For scientists and others can, and regularly do, talk and think very profitably about points in 6-dimensional space, imaginary numbers, transfinite cardinals and null classes, about perfectly elastic bodies, frictionless machines, ideal gases and force-free particles, without assuming or implying that they exist, without there being any clear case for claiming that they are reducible to items which do exist. The objects of theories, hypotheses, arguments, inferences and conjectures need not exist, and commonly do not exist.[2] When abstract models are used in sciences, as they so often are, elements of the models are very often not assumed to exist. For instance, many elements of imaginary collectives used in representing probabilities of individual events are known not to exist. With the harmonic oscillator model used by Planck in studying black body radiation it is not supposed that black

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(footnote [3] continued from page 28)

and he fails to notice the important exact ideal items of mathematics and theoretical science, the study of which does much engage men of science.

Findlay's other "fatal weaknesses" in the theory of objects are examined in a later essay on objections to the theory.

[1] In two letters to Meinong, in 1905 and 1907, Russell expressed his agreement with Meinong's assertion that pure mathematics is an existence-free science (Kindinger 65). And Russell advances similar views in Principles, e.g. p.472, and p.458 where it is said 'mathematics is throughout indifferent as to whether its entities exist'. This is compatible neither with Principia Mathematica, where many existence claims appear (including such notorious axioms as those of infinity, choice, and reducibility) nor with Russell's later contention that in theories of objects

> there is a failure of that feeling for reality which ought to be observed even in the most abstract studies. Logic, I should maintain, must no more admit a unicorn then zoology can; for logic is concerned with the real world just as truly as zoology, though with its more abstract and general features (18, p.169).

Logic is concerned with the real world, since it states logical truths, but not only with it (or with it other than as a certain sort of world). And just as systematic zoology can be quite properly concerned with imaginary animals and with universals (such as species), so logic can be - and indeed very much is - concerned with nonexistent objects.

Since moreover unicorns do not exist, they do not have to be ascribed existence in this or that way, e.g. in heraldry or in the mind, in the way Russell supposes.

The thesis that mathematics is - or should be - existence-free is much older, and is to be found, for example, in the Scottish philosophy of common sense. According to George Campbell in his Philosophy of Rhetoric.

> No 'conclusions concerning actual existence' can be drawn from a mathematical proposition (Grave 60, p.118);

and according to Reid

> from no mathematical truth can we deduce the existence of anything; not even of the objects of the science (Reid 1895, p.442).

[2] The subterfuge of saying that nonetheless these objects have mathematical existence is dealt with in the chapter on objections.

bodies are literally made up of harmonic oscillators. If space is in fact quantized not all the limit and cut points of applied classical mathematics actually exist; but the truth-values of almost all statements of classical mathematics would be unaffected. Likewise, in systematic zoology imaginary link animals with intermediate features (certain intermediate taxa) play an important theoretical role, but they are not assumed ever to have existed.[1] Theoretical items of science need not be - and commonly are not - theoretical entities.

We commonly enough, both outside and inside science, make true claims about objects without implying either that they exist or that they do not, or, in some cases, without knowing whether they exist or not. Thus sometimes the bracketing of existence assumptions is, so to speak, obligatory. Many of these claims correctly ascribe properties to nonentities. Consider, for instance, claims about such various objects as flying saucers and abominable snowmen, and (at appropriate times) aether, phlogiston, and Piltdown man. To determine whether aether, for example, exists or not, experiments (such as the Michaelson-Morley experiment) are designed which rely on recognised properties of aether. As Meinong put it (10, p.79):

> If one judges that a perpetual motion machine [flying saucer] does not exist, then it is clear that the object whose existence he is denying must have certain properties and indeed certain characteristic properties. Otherwise the judgement that the object does not exist would have neither sense not justification.

Moreover without such an approach there are serious difficulties in accounting decently not just for our predecessors' statements regarding the false theories that litter the history of science, but for our present scientific situation: for some of our more extravagant theories may turn out to be false or about what does not exist.

> If we feel entitled to say that our ancestors quite literally did not know what they were talking about (did not know what they were attempting to name, what the external world contained), why should we assume that we are any better off? (Rorty 76, p.321).

The problem disappears once the assumption that, because 'our inquiring ancestors often failed to refer (because they used terms like 'luminiferous aether', 'daemonic possession', 'caloric fluid', etc.) [they] produced statements which were either false or truthvalueless' (p.334), is dropped, and it is admitted that the ancestors were sometimes talking, sometimes truly, about things that do not exist.

Also we commonly make true claims about the nonexistent objects of fiction, legends and mythology,[2] e.g. 'Pegasus is a winged horse', 'Pegasus was ridden by Bellerophon', 'Mr. Pickwick was a fat man', 'Sherlock Holmes was a detective', and so on. Logically these objects have a good deal in common with the objects of mistaken scientific theories. Not only in the case of fiction and myth, but also in the discussion of these, in play-acting and role-acting contexts and in pretence situations, we commonly talk and think about objects that do not exist, and which, for the most part, we know do not exist. (Playing-acting and pretence situations lead on, however, to the very important classes of true intensional statements about nonentities.) The drive to eliminate or analyse away the true statements of fiction, legend, and so on, is exceedingly strong, so strong that many philosophers are prepared to sacrifice virtually all intuitive data concerning the objects of fiction. And, of course, given the Ontological Assumption it is essential to analyse such expressions away through some theory of fictions or descriptions if a pernicious platonism is to be escaped. For in this case platonism has to be avoided: to say that Pegasus exists or Mr. Pickwick exists conflicts with completely firm data. No one, certainly not any noneist, wants to claim that Pegasus exists.[1] Once an actual-denotation theory of meaning is completely abandoned, the forces pushing philosophers either into theories of fictions or descriptions, incomplete objects or incomplete symbols, on the one hand, or into platonic realism on the other hand, are dissipated. Then, and only then, an unprejudiced investigation of the logic of fictions can be made.[2]

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[1] See, in particular, the dispute between Gregg and others as to the intensionality of evolutionary taxonomy in Systematic Zoology, 1966 on. On the role of intermediate taxa, which need not exist, see, e.g. Hull and Snyder 69.

[2] There is a growing body of philosophical literature defending this commonsense claim; see, e.g. Cartwright's case (63, p.63 ff) for the truth of the statements "Faffner had no fat" "Faffner was the dragon Siegfried slew" and "Faffner did not (really) exist"; and Crittenden's defence (70, pp. 86-8) of the truth "The cyclops lived in a cave".

Another familiar but striking case of discourse where properties are attributed to non-existent items is provided by talk of purely past and future items. Given that one rejects (as we shall in chapter 2) the perverse usage of the present tense 'exists' under which a past item is said to exist now because it once existed and a future item became it will exist, one must say that purely past and future items do not exist. But past and future items nevertheless have very many definite properties. It is entirely correct, and reasonable, to say of Aristotle both that he does not exist (although he did) and that he has the property of having been born in Stagyra. Similarly for future items: the greatest philosopher of the 22nd century is not yet born, but he will study some philosophy.

Support for the Independence Thesis derives, next, from negative existentials, and the like. When denials of existence are made, as, e.g. in 'But Pegasus does not exist', 'Mermaids don't exist', 'No ghosts exist', the designating expressions could not carry existential loading. Otherwise all statements denying existence would be inconsistent, and all affirming existence redundant - consequences which plainly do not hold. This argument adapts an argument for existence not being a property. Other arguments adduced in favour of the misguided thesis that existence is not a property can also be converted into arguments for the IT. Similar points also hold good for assertions of possibility and impossibility; for instance, if

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[1] Of course we can say if we like (like Crittenden 70) - though it is misleading - that Pegasus exists in fictional space, and certainly we can claim that in some possible worlds Pegasus exists, since it is logically possible that Pegasus exists.

[2] It is not good enough, as we will see, to convert all fictional statements into intensional ones, e.g. To such forms as 'Once upon a time ...', 'It is written in The Pickwick Papers (that) ....', 'The Odyssey says (that)', etc.

'Rapseq' carried ontic loading in the true assertion 'Rapseq is impossible' then the assertion would inconsistently presuppose both that Rapseq is possible and that it is not.

Nor can these conclusions be fully escaped by attempts to analyse away non-existence claims in the Moore-Russell way, namely by translating 'ξ do(es) not exist', where ξ may be singular or plural, as 'No existing thing(s) are (is) ξ' or 'Everything that exists is other than (a)ξ', so reducing apparent nonexistence claims to quantificational claims only. For though it is true that the "translation" indeed furnishes a strict equivalence (under weak assumptions),[1] it does not preserve requisite features which are more intensional than modal; in particular, the equivalence does not preserve point, meaning and aboutness, and so it does not warrant intersubstitutivity in non-modal intensional contexts. The differences, however, between such sentences as

(i) Dragons do not exist,

and its proposed analysis

(ii) No existing things are dragons,

are not confined to the intensional (still less, as Grossmann 74 supposes, to differences in the thoughts of those who express them). Consider (as in Griffin 78) free logical models where i) and ii) differ in value assignment. In an empty domain on an expected intermediate interpretation, i) will be true but ii) will lack a value (or have "value", *gap*) on account of presupposition failure. The analysis fails entirely with statements that say that the domain of entities is null, such as 'Nothing exists'; for what the analysis would lead one to expect, e.g. 'Everything is non-self-identical' is logically false, whereas it is perfectly possible that nothing exists. (The latter assertion also strongly resists classical expression.) In a similar way to empty domain situations, i) and ii) are distinguished *contextually*; there are contexts (parallelling the models) where i) holds but ii) does not. Sentences i) and ii) also seem to differ in what they are *about*, i) being about dragons and ii) about all existing things.

Meinong (in Stell, p.38) made essentially this objection to the analysis of 'Ghosts do not exist' as 'No actual thing is ghostly', namely that whereas the subject expression of the analysandum is about pieces of reality the subject of the original is intended to designate 'what does not exist and is therefore not a piece of reality at all'. Naturally this is denied, vehemently, by reductionists,[2] who claim that a major aim and advantage of the proposed analyses is that they show that negative existentials such as i) are not really about their apparent subjects. But as Cartwright in effect remarks (63, p.63) the questionableness of this claim

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[1] In neutral logic, *in contrast* to more classical logics, this is readily proved, for example as follows in the singular case:- Everything that exists is distinct from a, symbolised $(\forall x)(x \neq a)$ is strictly equivalent, as its reading indicates, to $(x)(xE \supset . \, x \neq a)$, i.e., by contraposition, $(x)(x = a \supset . \sim xE)$. Hence, by instantiation, since $a = a$, $\sim aE$. Conversely, (since E is transparent) $\sim aE ⥽ x = a \supset \sim xE$, whence generalising and distributing (since x is not free in $\sim aE$), $\sim aE ⥽ (x)(x = a \supset \sim xE)$.

[2] Thus, e.g., Broad (53, p.182) who comparing 'Cats do not bark' with i) says

> It is obvious that the first is about cats. But, if the second be true, it is certain that it cannot be about dragons, for there will be no such things as dragons for it to be about.

> is indicated by the linguistic outrage we feel
> at being told that i) is not about dragons;

and he goes on to present some of the considerations which incline us to say that i) is about dragons. (The underlying fact is that strict equivalence transformations need not preserve aboutness.)

The Moore-Russell analysis fails more conspicuously in intensional settings; for neither strict equivalence nor coentailment guarantee substitutivity salva veritate in such settings, so that a logic adequate for intensional discourse cannot dispose of negative existentials in the now classical way. Consider, to illustrate, Findlay's correct, but not uncontroversial, argument that

(iii) A philosopher's stone does not exist

cannot be satisfactorily analysed, preserving sense and content, as

(iv) Everything in the universe (i.e. that does exist) is distinct from a philosopher's stone.

A person who wishes there were a philosopher's stone may wish

> not that any of the objects in existence should
> be other than it is, but that some other object,
> some object not comprised among the objects of
> our universe, but whose nature is nevertheless
> determinate in various ways, should be comprised
> in that universe, that is, should exist. (Findlay 63, p.53).

More formally, take as functor Ψ, 'RR may now wish that it is not the case that'; then Ψ iii) is true but Ψ iv) is not (I can certify both).[1]

Examples like Findlay's can be multiplied. Consider the only person surviving after an explosion, who hopes for or seeks a companion. Or consider a person who could prefer that more things existed, or a person who simply desires that something that doesn't exist exists as well as just what does exist. Indeed it is, contrary to the Moore-Russell analysis, consistent that something which doesn't exist may exist while everything else that exists remains substantially the same.[2]

With intensional features we arrive at a rich, and important, class of features that nonentities may have. Intensional properties, of a range of sorts, are regularly, and correctly, attributed to nonentities. However debatable and hazy various features of the fountain of youth might be, it is established fact that it, and not some other item, was what was sought by

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[1] Semantically, the domain of existents, e(T), of the actual world T is bound to remain fixed (though reductionists are tempted to say it has changed), but the domain of entities e(w) of the situation w that RR may wish for or that Findlay envisages may include $e(T) \cup \{a\}$ where a is some object not in e(T).

[2] Modal semantics with nonconstant entity domains will establish the basic point. But the larger issues then emerging are those of the correctness of such principles as the Barcan formula and that, developing from 'substantially the same', of conditions for transworld identity. These larger issues are rejoined later, §17 ff.

Ponce de Leon. Ponce de Leon looked for something, and that something did not exist, which was why he failed to find it. He and many others believed it gave eternal youth, and this property of being believed to give eternal youth is unaffected by the fountain's failure to exist. People imagine, wish for, expect to see, seem to hear, hope to find, worry about, and fear items which do not exist. Even when such items do exist, the ascription of intensional properties to them often does not imply that they do exist. Intensional properties, then, typically carry no commitment to existence; we can as readily think of a unicorn as a bicycle.

Both Reid and Meinong[1] appeal to intensional relations in elaborating their case against the Ontological Assumption and associated prejudices. Reid argues thus (1895, p.358):-
Consider

> that act .. we call conceiving an object ... every such act must have an object; for he that conceives must conceive something. Suppose he conceives a centaur, he may have a distinct conception of this object, though no centaur ever existed.

A centaur, an object which does not exist, has nonetheless the property of being conceived by someone.

There are several distinctive classes of intensional predicates which serve to relate havers of intensional attitudes to non-existent objects of one sort or another. These include epistemic and cognitive functors such as 'fears', 'believes', 'thinks', and 'conceives', assertoric and inferential functors such as 'infers', 'asserts', 'deduces', 'includes', 'hypothesizes' and 'conjectures', and also, so it will be argued, perception terms. With perception verbs, such as 'perceives', 'sees', and 'smells', it is not always legitimate to infer from the truth of the perception claim that the item perceived does (or does not) exist. The claim "a perceives m" may be true even when m is illusory or chimerical. In such sentence contexts the expression 'm' very often does not carry any ontological loading. Special compounds like 'seems to see', 'appears to smell' are in fact commonly employed to do just such a job philosophically and ordinarily, in cases of mistaken, questionable, or tentative perception.

The intensionality of a subject predicate statement of the form $(a_1,\ldots,a_n)f$ may arise either 1) from the intensionality of the predicate or 2) from an intensionally-specified subject (or term) a_i[2] or 3) from both. (An intensionally specified term in turn involves an intensional predicate, i.e. it is of a form such as $(\tau x)xf$ where τ is a descriptor and f is an intensional predicate.) Let us consider in more detail some important cases falling under these classificatory headings. Straightforward relational statements falling under head 1), i.e. of the form aRb where a is a creature, R an intensional relation, and b a nonentity - that is, then, of the form bf where b is a nonentity and f an intensional property - form the first of the four types of statements that Chisholm distinguishes in his classification of 'true *intensional* statements that seem to pertain to objects that do not exist' (72, p.30).[1] Statements of this type, e.g. Chisholm's

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[1] Meinong was, it seems, initially motivated to develop a theory of objects because of the importance of nonentities of various sorts in descriptions and explanations of thought and assumption. Some of the important features of the intensional had already been emphasized by Brentano: indeed Brentano relied on them in his inadequate criterion of the mental. And, according to Meinong (GA II, p.383), it is of the essence of an intensional attitude that it may have an object even though that object does not exist: but this claim too is unsatisfactory.

[2] The subjects may be propositional expressions, of the form §p, i.e. that p where p is a sentence.

(a) John fears a ghost,

simply will not vanish, under paraphrase or reconstrual, into statements which can be seen to involve no such apparent reference to a nonexistent object. Can we find a reconstrual, or a paraphrase? 'So far as I have been able to see, we cannot' (Chisholm 72, p.30). That we cannot will be argued in much greater detail subsequently; but it is not too difficult to see that none of the usual proposals for eliminating or absorbing the "misleading" term b can succeed. The reconstrual proposals are sometimes[2] prefaced by the claim that Meinong did not understand the use of nonreferring terms, such as 'a ghost', in intensional frames, that he mistakenly supposed that the phrase 'a ghost' has a referring use in (a).

> But just what was the mistake that Meinong made? He did not make the mistake of supposing that the word 'ghost' in 'John fears a ghost' is used to refer to something that exists or to something that is real (72, p.31).

The mistakes belong, in the main, to the usual reconstrual proposals, which are the following:-
(α) Elimination of misleading terms (i.e. talk about nonentities) by way of theories of (indefinite) descriptions does not get to grips with examples, such as (a), of the form aRb. For as transcriptions such as (∃x)(x is a ghost and John fears x) are patently wrong, the object term has to be enclosed by a predicate for the theory to apply, i.e. aRb has to be converted to something of the form aR'[bf], e.g. to take a much favoured proposal

(a) is converted to

(a') John fears that a ghost exists

But (a'), which is then transformed to 'John fears §(∃x)(x is a ghost)' is not equivalent to (a): neither implies the other. The general failure of the conversion of aRb to aR'§bE to preserve meaning or even truth is evident from other examples, e.g. 'John is thinking of Pegasus' cannot be rephrased preserving truth as 'John is thinking that Pegasus exists'. And in many cases such an existential conversion is not available, e.g. 'John is looking for a goldmine'. Conversion failure also means that paratactic analyses, such as Davidson's accounts of *saying that* and *believing that* do not apply, without a preliminary, and problematic, conversion, of aRb to aR'§bf.

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[1] Though Chisholm's distinctions will bear, like most bridges, only a limited load, they are most helpful for the present prima facie case for the IT, and will be taken over in what follows. The paragraphs which follow borrow very heavily from Chisholm's exposition 72. All quotes not specifically indicated are from this exposition.

[2] Thus, for instance, Ryle in his work on Meinong and on systematically misleading expressions, and Findlay 63, p.343.

(β) Replacement of misleading terms by concept names, i.e. transformation of talk of nonentities into talk of concepts or properties. It is often suggested by those working in the Fregean tradition that 'a ghost' in (a) is 'used to refer to what in other uses would constitute the sense or connotation of 'ghost''. Obviously (a) cannot be rephrased preserving truth as 'John fears the concept of a ghost', since John may well have no fear of concepts. 'John himself may remind us at this point that what he fears is a certain *concretum*', not some abstraction such as a concept or a set of attributes. No, the general proposal is that aRb be paraphrased as aR'(the concept of b), where R' is some new relation different from R, or, still more sweepingly and less assessibly, 'as telling us that there is a certain relation holding between [a] and a certain set of attributes or properties. But what attributes or properties, and what relation?' The only way of explaining the new relation R', not only generally but in most specific examples such as (a), is by appeal back to R itself: R'(the concept of b) is explained in terms of Rb. The elimination presupposes what it is supposed to be eliminating. As Chisholm earlier remarks - a telling point that applies against several proposed analyses in both Fregean and Russellian traditions -

> It is true of course that philosophers often invent new terms and then profess to be able to express what is intended by such statements as "John fears a ghost" in their own technical vocabularies. But when they try to convey to us what their technical terms are supposed to mean then they, too, refer to nonexistent objects such as unicorns.

Furthermore Fregean replacements only succeed given a thoroughgoing platonism according to which *all* concepts exist; for, for any object b whatsoever, it is true that someone may have been thinking of b. Such a thoroughgoing platonism is acceptable neither to noneism or nominalism or to positions forced into admitting that some concepts exist, and for good reasons (e.g. concepts of impossible and paradoxical objects do not have the right properties to exist).
(γ) Replacement of misleading terms by their names, e.g. aRb is replaced, in the first instance by aR'b', and then, since this is evidently inadequate (John may not fear the phrase 'a ghost'), by aR"b'. Replacements of this sort are proposed by Carnap in the *Logical Syntax* (LSL, p.248), e.g. 'Charles thinks A' was to be translated as 'Charles thinks 'A'', are entertained by Wittgenstein in the *Tractatus*, and are implicit in Ryle's criticism of Meinong in 71, p.225ff and in 72). The proposal is open to the objections lodged under (β) - e.g. 'What ... would "John fears a ghost" be used to tell us about John and the word "ghost"?' - and to others, e.g. the familiar translation objections and quantification objections (see chapter 4).
(δ) Absorption of misleading terms as parts of the predicates in which they occur, e.g. aRb is really about just a and of the form aR-b with predicate R-b. Thus the phrase 'a ghost' in (a) functions only as part of the longer expression 'fears a ghost'. The absorption proposed takes various forms. For example,

> it has been said that the word 'ghost' in 'John fears a ghost', is used, not to describe the object of John's fears but only to contribute to the description of John himself. This was essentially Brentano's suggestion. But just *how* does 'ghost' here contribute to the description of John? ... Surely the only way in which the word 'ghost' here contributes to the description of John is by telling us what the object is that he fears (72. p.31);

so the related object is not absorbed. Moreover the proposal gets into serious difficulties, as do all absorption proposals, over the inferences that can be made from (a). Since the object can be particularised upon, to yield 'Something is feared by John' (generally, (Px)aRx), and alternatively identified, to yield 'John fears a disembodied spirit' (generally, if aRb and b = c, for suitable identities, then aRc), the object term fills a full object role, and cannot be absorbed without destroying legitimate connections. It is just these sorts of things that are wrong with the hyphenation proposal according to which 'ghost' in 'fears-a-ghost' has no connection with the occurrence of 'ghost' in such sentences as 'There exists a ghost' and 'Charlie saw a ghost'. Strictly, 'ghost' no more occurs in the sentence than 'unicorn' in 'The Emperor decorated his tunic ornately' (Chisholm's example). For that the proposal is mistaken and that there is a connection

> may be seen by noting that "John fears a ghost" and "John's fears are directed only upon things that really exist" together imply "There exists a ghost" (72, p.31).

Chisholm's second type of intensional statement, which is exemplified by

(b) The mountain I am thinking of is golden,

includes not an intensional main predicate but an intensionally specified subject (which does include, however an intensional predicate). Such statements are a special class of those that fall under classificatory heading 2). It is easy to supply contexts in which (b) may be true, though the mountain in question does not exist. Again proposals for paraphrasing or absorbing the "misleading" object - proposals which, for the most part, parallel the proposal already rejected in the case of the first type - fail minimum adequacy tests. For example, Russell's theory of definite descriptions, applied in a straightforward fashion to (b), fails to preserve truth, for it transforms (b) to what is false, 'There exists a unique x such that x is golden and I am thinking of x'.

Chisholm's remaining two types of true intensional statements are very special cases falling under classificatory heading 2: they are identity statements of the form "a is identical with b" where both a and b are intensionally specified subjects, with the subjects concerning in the third type different persons and in the fourth type the same person. Examples of the type three and type four statements are respectively,

(c") The thing he fears the most is the same as the thing you love the most,

(d) The thing he fears the most is the same as the thing he loves the most.

In fact the generating example for Chisholm's exemplification,

(c) All Mohammedans worship the same God,

of his third type of intensional statement, is

(c') The God a worships is the same as the God b worships, for any Mohammedans a and b.

What these and other identity cases, such as

(e) What I am thinking of is Pegasus,

appear to show is that true identity statements can be about nonentities in a quite uneliminable way. Yet again Russell's theory of descriptions delivers intuitively wrong truth-values for such statements; and other paraphrases and reconstruals, where they work, are little, if any, better than Russell's theory. Thus Chisholm's conclusion (72, p.33) is apt:

> I think it must be conceded to Meinong that there is no way of paraphrasing any of [the intensional statements (c)-(d) exemplified] which is such that we know both (i) that it is adequate to the sentence it is intended to paraphrase, and (ii) that it contains no terms ostensibly referring to objects that do not exist, ... [And prevailing logical theory] is not adequate to the statements with which Meinong is concerned. But this fact, Meinong could say, does not mean that the statements in question are suspect. It means only that such logic, as it is generally interpreted, is not adequate to intensional phenomena.

Intensional features, though vital to the defence of the Independence Thesis, are however not enough. The appropriate inherence of intensional features in an object requires a non-intensional basis. Fortunately the necessary basis is readily discerned. For, to anticipate a little, an item can also be truly said to have the (extensional) properties by which it is characterised: this holds for a large range of (extensional) properties of nonentities. Thus the golden mountain is golden, a winged horse does have the property of being winged, and Meinong's round square the property of being round. As with logical properties it is possible to attribute such properties without assuming that the item to which they are attributed exists, because there is a way of deciding whether they apply without examining a referent; for instance by seeing whether they follow from the characterising description of the item. Both sorts of necessary properties, logical properties and characterising properties, can be properly attributed to nonentities because necessary truths can be established by a priori means.

Although there is nothing to prevent logical properties and characterising properties being attributed to nonentities, we do not claim that all such attributions would be immediately recognised by every competent speaker as completely natural or uncontroversibly correct. But the possession of such properties by nonentities must be recognised if we are to account for the attribution to nonentities of intensional properties, which are natural and indispensable. One of our arguments will be that the possession of logical and characterising properties by nonentities is a necessary pre-condition of their possession of intensional properties. It is an extrapolation from some natural language discourse which is necessary for its theoretical organisation and explanation.

It will, presumably, be objected against these examples that the subject terms are not really about nonentities, that the properties ascribed are not genuine properties. The main ground, however, for such contentions, the adoption of referential criteria (such as the possession of a property by an item under any description) for genuineness of property and subject, simply begs the question. It begs the question because if we can use some statements about nonentities, such criteria cannot be correct. The other main ground for this objection is the faith, already encountered with negative existentials, that such statements can be alternatively reconstrued as statements about existing items, so there is no need to take them as counterexamples to the Ontological Assumption. We shall have more to say on such reduction attempts later. But so far this programme is little more than a promise, since no such reductions have been satisfactorily carried out; while they remain mere promises - and promises which there is no good reason other than the Ontological Assumption itself and the mistaken theory of meaning on which it is based, to suppose capable of being met - such reductions cannot provide a good argument against taking these statements as about what they appear to be about, nonentities.

The case against the Ontological Assumption does not rest however, just on examples. Because we distinguish some nonentities from others, and also identify some with others, nonentities cannot be featureless, as the Ontological Assumption implies they are. They must have properties to distinguish them. Thus Pegasus is distinct from Cerberus, since one is a horse, the other a dog; and mermaids are different from unicorns.[1] On the other hand, because of coincidence of properties, Aphrodite is identical with Venus, and Vulcan with the planet immediately beyond Pluto. For the purpose of the argument it is only necessary to show that some nonentities are distinct from one another, not that there are never problems or indeterminacy about the identity and distinctness of nonentities. The truth of identity and distinctness statements about nonentities can only be adequately explained by supposing that the items themselves have properties. The same goes for likeness and unlikeness claims. Contrary to the usual supposition, differences in the associated concepts or senses of expressions - or worse still in the associated names - will not do. While we might be able to explain the truth of a distinctness statement such as 'Unicorns are distinct from mermaids' by reference to the distinctness of the concepts unicorns and mermaids or the difference in the senses of expressions 'unicorns' and 'mermaids', we cannot similarly explain the truth of a contingent identity statement such as 'What I am thinking about is identical with a unicorn' by reference to the sameness of the concepts or senses involved, because they are not the same. And to explain the truth of the identity statement by identity of reference, by saying that the concepts apply to or the expressions refer to the same items, is to push the responsibility for the truth of the identity back to the items themselves, and therefore to admit that the items must have properties. Yet unless some other entities can be produced whose identity or difference can explain such contingent identity statements, we will have to fall back on the identity or difference of the items themselves, which entails that they have properties.

To enlarge on the theoretical case against the Ontological Assumption is almost inevitably to detour into the theory of meaning. As theories of meaning which recognise two components of meaning, sense and reference, have some appeal, it is difficult to see why the Ontological Assumption should have remained largely unquestioned; for the failure of the Ontological Assumption is readily explained on such a theory. Suppose, as sense-reference theories do, that a subject-expression may have a sense but lack a reference. Since to have a reference is to exist, the theories suppose, correctly, that an expression 'a' may have a sense though a does not exist.[1] But quite a number of properties accrue to a just in virtue of the fact that 'a' has a sense. Because of the sense of 'a', a will have analytical, logical, classificatory and category properties. Hence nonentities have definite properties. In virtue of the sense of 'unicorn', unicorns are not the sorts of items that are prime or proved deductively though they are the sorts of items that are horned. Therefore unicorns have definite category properties. Also in virtue of the sense of 'unicorn', unicorns are necessarily animals. Therefore any given unicorn definitely has the property of being an animal, similarly any unicorn is necessarily a one-horned animal. It is partly in virtue of the sense of 'a' too that a has its intensional properties, and is, for instance, thought about, feared, and believed to be red in colour. Of course not all properties can be possessed or lacked by an item a in virtue of the sense of 'a' - some can only be had or lacked if 'a' also has a reference, i.e. if a exists. Nevertheless it is enough that some properties may be possessed in this way, in virtue of 'a's having a sense, for then a will have properties even though it does not exist, contradicting the Ontological Assumption. The fact that the Ontological Assumption is so widely assumed and so rarely questioned is an indication, then, that reference theories of meaning have not really been supplanted by genuine second-component theories.

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[1] Not only can nonentities be distinguished and identified, they can be counted as Meinong remarked, e.g.

> 'we can also count what does not exist' (TO, p.79.)

And as Chisholm added:

> A man may be able to say truly 'I fear exactly three people' where all three people are objects that do not exist (72, p.34.)

Along with sense properties, nonentities have other semantical features; e.g. the semantical statement "The word 'Einhorn' in German designates unicorns" ascribes such a property to unicorns. Both Meinong and Chisholm want to say

> that semantical statements are really a subclass of intensional statements, statements about psychological attitudes and their objects. ... To say that "Einhorn" is used to designate unicorns, according to Meinong, is to say that "Einhorn" is used to express those thoughts and other attitudes that take unicorns as their objects (Chisholm, 72, p.38).

Avoiding this (understandable) confusion of semantics and pragmatics is important for the semantical theory to be developed. It is also important in meeting criticisms of the theory that the basic semantical relations, e.g. designating, being about, and so on, are not intensional or psychological. As a matter of definition of intensional they are not intensional: evaluation of "'a' designates a" involves no world shifts. Meinong and Chisholm are mistaken in claiming that semantical statements are intensional.

As well as semantical and sense properties, nonentities also have, as already remarked, logical properties. Thus, for instance, each nonentity is self-identical, and, because different from other nonentities, different from something; and in general nonentities exemplify logical laws. There is nothing about very many logical properties or the way they are determined which would limit their correct ascription to entities. For pure logical properties carry no commitment to existence. Moreover it is widely believed that logic should take no account of, and indeed takes no account of, contingent matters.

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[1] The argument is that if some item a, say, does not exist, the statement "a does not exist" must be true. But if the statement is true, the sentence must have a sense; so too 'a' must have a sense though it lacks an actual designation, i.e. a referent.

Why then should the possession by an item of a logical property, such as self-identity or membership of some set, have to depend upon the accident of the item's existing? But once again, logical features do not serve to distinguish nonentities, or even sorts of nonentities, from one another. That we do distinguish them is however evident from true intensional statements about nonentities, e.g. "Some primitive people fear ghosts but not mermaids". (Almost everyone knows the difference between a ghost and a mermaid, for all that logicians' theories of descriptions prove that they are the same.) So we are led again, ineluctably, to further extensional features of nonentities, and to a more thoroughgoing rejection of the OA.

Acceptance of the Independence Thesis and rejection of the Ontological Assumption have far-reaching philosophical consequences, as will become evident. For example, traditional and standard discussions of such items as universals and objects of perception and of thought are entirely subverted (see subsequent essays). Some more immediate and local effects are worth recording immediately.

A corollary of the Independence Thesis is - what Grossmann (74, p.67) considers a central doctrine of Meinong's theory of objects - that nonexistent objects are constituents of certain states of affairs. For if a nonentity has some property then it is a constituent of the state of affairs consisting of its having that property, and so a constituent of a state of affairs. In fact the constituency thesis is logically equivalent to the Independence Thesis (in property form). For, conversely, if a nonentity is a constituent of a state of affairs then it has a property, namely the property of being a constituent of that state of affairs. And exactly as an object can truly have a property even though it does not exist, so an object can be a constituent of a state of affairs which obtains even though it does not exist.[1]

A second corollary is that the thesis, affirmed by Prior (57, p.31) and in fact quite widely adopted, that "a exists" is logically equivalent to "there are facts about a" is false.[2]

Similarly such arguments for the existence of universals as Moore's argument for the existence of Time from temporal facts (such facts as a's preceding b and a's happening at ten o-clock, e.g. Moore's having his breakfast at this time) get faulted. For they depend essentially on an application of the Ontological Assumption.

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[1] The logic of the constituency relation accordingly differs from that of inclusion, and the part-whole relation to which it has sometimes been assimilated. Rather, a is a constituent of state of affairs ϕ iff ϕ is of the form $\psi[b]$ and a is identical, under criteria which permits replacement in ψ contexts, with b.

For a more comprehensive discussion of problems to which rejection of the thesis that nonentities are constituents of certain states of affairs lead, see Griffin 78 and 79.

[2] On this thesis hangs Prior's case for the development of chronological logic in his idiosyncratic fashion. Given the Independence Thesis, Prior's case collapses. But this hardly matters at least as far as chronological logic is concerned; for within a neutral logic more appealing and comprehensive tense logics can be developed, as the next essay tries to show.

1.4 THE "PROBLEM" OF NEGATIVE EXISTENTIALS

Another advantage accruing at once from the rejection of the Ontological Assumption is that the so-called "problem of negative existentials" is simply dissolved. Really the problem is generated by the Ontological Assumption, and disappears with its rejection. The problem is how can one truly make a statement about a nonentity, e.g. Pegasus, to the effect that *it* does not exist or: how can the statement "Pegasus does not exist" (symbolised, p~E) be both true and about Pegasus? The problem arises because p~E being a truth about p, i.e. Pegasus, implies, by the Ontological Assumption, pE, whence, since p~E implies ~pE, a contradiction results. The basic trouble is of course that pE is not true, though p~E is true, in conflict with the Ontological Assumption.

However the traditional negative existential problem is directly generated not by the Ontological Assumption (OA) but by strict consequences of the OA such as the Aboutness-Implies-Existence Assumption (AEA), i.e.
(the statement) that af is about a implies (presupposes) that a exists.
The AEA follows from the OA using the truth that if a statement is about object a then, necessarily, a has some characteristic. Now if a is a nonentity then a~E, and so ~aE is true; but a~E is about a, whence, by AEA, aE, contradicting ~aE.[1] The problem is dissolved once the AEA is seen through: the assumption

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[1] Cartwright (63, p.56) gives, in effect, the following neat, and more general, formulation of the argument:-
Let S be a negative existential, i.e. a denial that ξ exist(s), with ξ singular or plural, e.g. a class term such as 'ghosts'. (S may take various forms, e.g. 'There are^E no such things as ξ', 'ξ do(es) not exist', 'No such object(s) as ξ exist(s)'.) Suppose S is true. But
p1. S is about ξ;
p2. If S is about ξ, then ξ exist(s) [there are (is) ξ]
p3. If ξ exist(s), S is false.
Therefore, S is false.
The argument from p1-p3 to the conclusion is valid, but p2 is false. If however 'ξ exist(s)' is replaced, as in Cartwright's actual formulation, by the bracketed clause 'There are (is) ξ' then the argument can be given true premisses, but at the cost of equivocation on 'there are' as between existentially-loaded and unloaded forms, p2 and p3 becoming respectively (in plural form):
p2'. If S is about ξ, then some things are ξ; and
p3'. If there exist (some existent things are) ξ, S is false.
The middle term is different: so this argument has obtained its appearance of soundness by equivocation.

So far all this makes the dissolution proposed look rather like what Cartwright calls an Inflationist answer. It is not; and the choice between Inflationist and Deflationist accounts is a false choice (as Cartwright's own suggestions, especially p.66, should make plain.) No inflation of what exists is suggested: It is not being said with the Inflationists (the paradigm of whom is Russell of the *Principles of Mathematics*) that there are two kinds of existential statements, the second of which are affirmations or denials of *being*, as distinct from *existence*. Noneism is quite different from, and opposed to, such a levels-of-existence position. Though 'Dragons do not exist' (Cartwright's (9)) is about dragons, the noneist is *not* led, as the Inflationist is, to affirm the being of dragons. There is only one way of being, namely existence. It is true, however, in virtue of M1 that "a is not an object" is always false or meaningless (in a way parallel to Russell's "A is not"): it is nonsignificant where a is a nonsignificant subject, such as 'the weight of nine o'clock'. (footnote continued on page 43)

is strictly equivalent to the OA, and accordingly open to the case against the OA. For, to complete the argument for the strict equivalence, if object a has some feature then the statement that a has this feature is about a. A corollary is that once the Ontological Assumption is abandoned a theory of aboutness, where a statement may well be about items that do not exist, can be devised without obstacles such as the AEA (for such a theory, see SL chapters 2 and 3).

The ancient riddle of non-being - according to which 'non-being must in some sense be; otherwise what is it that there is not?' (Quine FLP, p.2) or 'whatever we can talk about must in some sense be something; for the alternative is to talk about nothing' (Linsky 67) - likewise depends on equivalents of the Ontological Assumption; for the "riddle" is little more than a restatement of the negative existential problem. Granted that the nonentity Pegasus has to be something, e.g. a horse, it does not follow as the Ontological Assumption would have, that it has to exist or be. The (grammatically encouraged) argument from "a is red" or "a is a red object" to "a is"(i.e. from Sosein to Sein) is as invalid as the argument from "a is a good burglar" to "a is good". There is no reason, then, to say that Pegasus must in some sense be or have being, and there are good reasons for avoiding such terminology; e.g. the apparent commitment of the terminology to subsistence or kinds of existence doctrines and the lack of any contrasts of being in the wide sense.[1] The riddle is given apparent depth by a play on such quantifiers as 'what', 'there is', 'something' and 'nothing', as between referential and nonreferential readings. For example, in talking about Pegasus, one is not talking about nothing, no item, though one is talking about nothing actual, no entity; what item it is that does not exist is, in this case, Pegasus, but there is no such entity as Pegasus.

The problem of negative existentials may be restated in quantificational form as follows: If "Pegasus does not exist" is indeed about Pegasus then, by existential generalisation and detachment, since the premiss is true there exists an item which does not exist, which is impossible. But where a does not occur referentially in 'af' the principle of existential generalisation

af implies $(\exists y)yf$

is invalid. Nor does the fact that 'af' is about a license existential generalisation; for aboutness does not imply existence. What is correct is the principle of particularisation:

af implies (Py)yf, i.e. for some (item), yf,

(footnote [1] from page 42 continued)

Finally, noneists can largely agree with Cartwright about the contrast between two sorts of negative existentials (and between sorts of designation), those that specify, or involve the specification of, particulars and those that don't, though they won't put the contrast in quite his way. As against Cartwright, 'The man who can beat Tal does not exist' is about the man who can beat Tal, just as 'Faffner did not (really) exist' is about Faffner; even so one who affirms the first does not purport to single out a particular thing in the way that one who affirms the second usually does (cf. pp.62-5).

[1] The real worry behind the riddle is as to how an item or "thing" can be other than a referent, an entity. Hence the equation of no thing with no entity and some thing with some referent. The real worry the Advanced Independence Thesis is designed to remove.

and hence, since $(\exists y)yf$ is strictly equivalent to $(Py)(yf \& yE)$, the free logic principle

$$af \& aE \text{ implies } (\exists y)yf.$$

The quantificational restatement of the problem of negative existentials fails then because existential generalisation (EG) fails. Given the breakdown of EG, it also becomes a simple exercise to expose all the usual reductionist arguments to the effect that it is impossible to make true statements about nonentities, arguments which help produce the "problem". Consider, for example, the following familiar argument:- If a statement is to be about something that something must exist [an invalid use of Existential Generalisation]; otherwise how could the statement refer to it, or mention it [an illegitimate restriction of objects to entities, and of aboutness to reference]. One cannot, the argument continues, refer to or mention nothing, which is what making a true statement about a nonexistent object would amount to [another illegitimate use of EG, coupled with an illegitimate restriction of quantifiers to existentially loaded ones, of 'nothing' to 'nothing existent'].

The rejection of existential generalisation is a major logical outcome of the rejection of the Ontological Assumption: it is also a rejection with far-reaching philosophical impact. The illegitimate use of existential generalisation, in arguing from a nonreferential occurrence of a subject to an existential claim, is a fundamental strategy not only in the problem of negative existentials but also in many other metaphysical arguments, e.g. in standard arguments for God and universals, for substance and self. Consider, to illustrate, Chisholm's argument from Hume's bundle theory of self to the existence of a metaphysical or transcendental subject, the self.

> When Hume said that he, like the rest of mankind, is "nothing but a bundle or collection of different perceptions", he defended his paradoxical statement with the following words: "For my part, when I enter most intimately into what I call myself, I always stumble on some particular perception or other, of hot or cold, light or shade, love or hatred, pain or pleasure. I can never catch myself at any time without a perception, and can never observe anything but the perception". These words are paradoxical, for in denying that there is a self which experiences all of his perceptions, Hume seems to say that there is such a self (60, p.19).

That is, in formulating the evidence for his thesis that the there exists no self, only perceptions related in certain ways, Hume refers to a self which has these perceptions, whence by EG, there exists a self. Hence, by reductio $(\sim A \rightarrow A) \rightarrow A$ (there is no paradox), the self exists. Hume undoubtedly is in trouble because of his commitment to the OA; nonetheless the famous arguments deployed by Kant and Russell (cf. Chisholm 60, p.20ff.) to show the existence of a transcendental self depend upon faulty applications of EG. The fact that I myself have properties does not entail that there exists a self.

Given the Independence Thesis many commonplace arguments, both major and minor, about nonentities, apart from EG, are rendered unsatisfactory. As we proceed we will find that the OA is respectably applied in philosophical argument: indeed it is not going too far to claim that it is the main ontological method in philosophy, the main method of arguing to existence, with the Ontological Argument to a necessary existent only the most blatant example of its application. As a minor example of the effect of the IT, the following sort of argument is undermined: The round square does not exist. Therefore, since, by the OA, nonentities do not have properties, such as roundness, it is false (or without truth-value) that the round square is round. The fact that such arguments fail is important in removing initial objections to the Characterisation Postulate.

Once the Ontological Assumption is completely abandoned (the concept of) existence can stop serving as a philosophers' football; we can stop playing ball over what does and does not exist. For what we say as to whether something exists will have much less bearing on what we can say about it, upon its features. We can foresake the easy platonism that even nominalists sometimes slip into over mathematics; for we have nothing to lose (in the way of discourse) by taking a hard, commonsense line on what exists, e.g. that to exist is to be, and to be locatable now, in the actual world. We are no longer forced to distinguish being or existence from actuality or to extend 'exists' beyond this sense, e.g. to numbers and to the ideal items of theoretical sciences, simply in order to cope with the fact that apparently nonexistent items figure fruitfully in many calculations and in much theory: for we may retain the (perhaps redrafted) theory while admitting that the items do not exist.[1]

§5. *The Characterisation Postulate and the Advanced Independence Thesis.*

The particular quantification of the Independence Thesis invites the question: which features do nonentities have? The defence of the Independence Thesis has already provided a partial answer: important classes of attributes that nonentities have, and share with entities, are intensional features, (ontological) status features, identity, difference and enumerability features, and logical features. But in order to have such features as these, nonentities must have other features which characterise them.[2] For example, in order that the planet Vulcan is distinct from Pluto, Vulcan must have extensional properties, such as mass and path, different from those of Pluto; and it was in fact concluded that Vulcan did not exist because empirical investigation disclosed no actual planet with these properties. In order that I can think of a unicorn without thinking of a mermaid, unicorns must have, as we know they do, different extensional properties from mermaids, and in thinking of a unicorn, or of a non-actual animal of importance in theoretical taxonomy, I am not thinking of nothing, though I am thinking of nothing actual, but I am thinking of an item with certain non-intensional characteristics such as being mammalian and having hooves. That nonentities do have those features which characterise them is explained and guaranteed by the Characterisation Postulate, the fundamental principle M6 of Meinong's theory of objects.

Sometimes, as we have seen (e.g. the quote at the beginning of the essay), Meinong included in his presentation of the Independence Thesis instances of this further principle, the Characterisation or Assumption Postulate, a principle which, at least as applied to nonentities, is very distinctive. Indeed there is a way of reconstruing the Independence Thesis, as the principle that objects have their essential characteristics independently of existence, which includes the Characterisation Postulate. According to the Characterisation Postulate objects, whether they exist or not, actually have the properties which are used to characterise them, e.g. where f is a characterising feature, the item which fs indeed fs. In setting up a logical theory the Characterisation Postulate (CP) has, however, to be distinguished from the full Independence Thesis (IT); thoroughgoing nonexistential logics satisfy the IT but not any very general forms of the CP, and getting a correctly qualified form of the CP is a more difficult matter than simply incorporating rejection of the OA, which is quite straightforward.

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[1] All these points will be much elaborated in what follows.

[2] This transcendental argument for the Characterisation Postulate - that its holding is a necessary condition for nonentities to have the other properties that they have - is elaborated in later essays.

An existentially restricted form of the Characterisation Postulate is an important ingredient in modern theories of descriptions;[1] the extension of the principle to nonentities, and particularly to impossibilia, is, as Meinong realises, an essential step in giving nonentities the status of full subjects, in making them more than logical dummies.

For the Characterisation Postulate provides a licence to do in any particular case what the IT indicates more generally that one should be able to do, namely to take any description which is legitimately constructed (i.e. which is characterising or assumptible) and employ it in the subject role to obtain distinctive true statements concerning the object it is about, namely those assigning to the object the characterising features its proper description assigns to it. Thus the Characterisation Postulate assigns to nonentities properties other than logical and intensional features; it extends to nonentities the privilege commonly only given by logical theories to entities, of having the features specified by their descriptions. In particular, if the description includes assumptible extensional features, e.g. 'is a square' or 'is round', then the object has these features.[2]

Thus the object which is round is round, and the round square, which is an object which is round and square, is round and square. A little more generally, an x which (is) f (is) f, and the x which (is) f (is) f, provided f is assumptible. By no means all predicates are assumptible, as will quickly emerge from intuitive considerations. But an important class of assumptible predicates - which covers the main, and controversial, examples of assumption that Meinong gave - are the elementary predicates, in the sense of Whitehead and Russell (PM, *1).

The Characterisation Postulate is fundamental for Meinong's distinctive position, e.g. on the philosophy of mathematics and of theoretical sciences: it explains how it is that mathematical and theoretical abstractions such as numbers and regular polyhedra, which do not exist, need not be assumed to exist in order to have their distinctive properties. It explains, in short,

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[1] For instance, the basic inference rule for proper descriptions in Kalish and Montague 64 is just a version of the CP qualified by the condition that there exists a unique object satisfying the description: an important application is the scheme:

$$\frac{(\exists y)(x)(A(x) \equiv x = y)}{A(\iota x\, A(x))}$$

[2] The fact that it has the features necessarily or a priori does not make the properties themselves intensional.

how mathematics is possible, and can operate: namely, by assumption. Similarly it explains how pure theoretical science is possible. More explicitly, the CP enables mathematical and other theoretical objects to have the properties ascribed to them, but without the usual platonistic assumptions; it provides a formal basis for mathematical postulation and construction without unwarranted existence assumptions. The Characterisation Postulate also explains what would otherwise be a problem for Meinong (since on his account nothing necessarily exists), how mathematical objects have their properties necessarily and not as a contingent matter, and how it is possible for properties of mathematical objects to be held extensionally. There are other important applications of the Characterisation Postulate which Meinong did not make, most of them deriving from the fact that the postulate makes it possible for nonentities to have extensional properties (see the explanation of extensional identities between nonentities given below).

As working examples of the CP let us take the following elementary cases, all of which Meinong would have approved:

(1) Meinong's round square is round

(2) Meinong's round square is not round (because square)

(3) The golden mountain is golden

(4) Kingfrance is a king.

The argument - an argument from characterisation and meaning - for these truths is simply that if f is a characterising feature of a then af is true. For an item has, necessarily, those properties which characterise it. In more formal mode, if being f is part of what is meant by 'a' then af is bound to be true, in virtue of the sense of a. For instance, the description 'the golden mountain' has a sense, since it is a nonparametric component of (3), and (3) is significant and has a sense. By 'the golden mountain' is meant 'the mountain which is golden', in other words 'the mountain of which it is true that it is golden'. But mustn't it be true of this (nonexistent) mountain that it is golden? If so, (3) is true.

The same considerations help show that the following examples are NOT cases of the CP:

(⊣ 1) The round square which exists exists

(⊣ 2) The most perfect entity is an entity and most perfect

(⊣ 3) The oil rig 10 miles south of Capetown^{E} is 10 miles south of Capetown^{E}.

Mere characterisation on its own cannot determine what exists or how things actually are interrelated. Of course once it is determined *what* something is then it can be found out whether or not it exists, where, *if anywhere*, it is, and what it is identical with. The rejected examples violate these principles. In case (⊣ 1), for instance, an impossible object presents itself, through its description, as also existing: but an object cannot decide its own existence by describing itself as existing, any more than a person can change his height or status by describing himself as of a different height or status. There are several corollaries which emerge from such rejections, the most obvious being that *existence is not a characterising feature*. In fact existence is only one of a larger and important class of properties - *ontic or status properties* - which are not assumptible. Other status predicates are, for example, 'is real', 'is fictional', 'is possible', 'is created'. The features such predicates specify are not assumptible, but rather supervenient or consequential; in particular, nonexistence and impossibility are consequential on roundness and squareness, and existence is consequential on suitable determinacy of elementary properties.[1] Existence, like identity, is a supervenient (or higher-order) property dependent on a class of elementary (or first-order) properties; thus, for example, one can no more have two items which are exactly the same in every respect *except* that one exists and the other does not, than one can have two items exactly alike in every respect except that one is identical with another individual and the other is not. Existence and identity are not simply further properties on a par with roundness and goldenness.

The standard (allegedly fatal) objections to Meinong's theory of objects - mostly repetitions of or variations on Russell's two objections that the theory engenders invalid ontological arguments and contradictions - all inadmissibly apply the Characterisation Postulate using predicates which are not assumptible. For example, it is alleged that the theory is inconsistent because on it the round square which exists both exists, since it says it does, and does not exist, since it is round and square: but the objection illegitimately applies the CP to the ontic predicate exists.[2]

Since a theory of nonexistent *objects* depends on assigning distinct properties to distinct objects, it depends - so a transcendental argument will show - on accounting as true statements like (1)-(4). That there is no entirely conclusive argument for assigning (1)-(4) truth-value true, should be expected especially in the light of rejections ($\dashv$ 1)-($\dashv$ 3). And it can be proved, after a fashion. For any argument can be broken by (new) distinctions from rival theories (typically from the Reference Theory) which show the argument to involve equivocations (a classic example is the distinction between the 'is' of identity and the 'is' of predication). But no more is there a conclusive case for assigning them value false, or some other value. There are however reasons and arguments for the assignments adopted.

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[1] The line developed here is *one* of the lines indicated by Meinong.

[2] The objections will be examined in much greater detail subsequently, and shown wanting. It will also be argued:

(1) Meinong, especially in his later work, restricted the CP; so the standard objections do not work against him any more than they succeed against the theory of items.

(2) The idea that the CP is, or should be, unqualified is a further hangover of the Reference Theory. If items were referents just like entities then they would like entities be fully assumptible. Hence a contradiction in treating items just as further referents.

(3) Classical logic, has in effect, a restricted CP for definite descriptions, *one* *half* of which can be kept, namely $(\exists!x)\ xf \rightarrow (\iota x\ xf)f$, i.e. entities are fully assumptible. In virtue of (1)-(4), the converse of the classical connection is of course rejected. Likewise the theory of items has a differently restricted CP. Only a totally naive theory would have an unrestricted CP. The situation is a *bit* like set theory; and in fact an unrestricted CP yields an unrestricted abstraction axiom (and much more).

An initial reason, linked with the argument from characterisation, is that assignment true is an, perhaps the, intuitive assignment to make to (1)-(4). Ask the philosophically untutored whether the golden mountain is golden and you will commonly get the answer that it is. Ask them whether it is true the man who squared the circle squared the circle and you will mostly get, not Russell's answer that is is not true (PM, 14), but the answer that it is true. Ask them whether the round square is round and square or what its shape is, and you will find that, though it is considered impossible or even curious, it is usually accounted round and square. That the intuitive assignment to (1)-(4) is value true, does not however show that it is the "correct" assignment (since the data is not sufficiently hard). It is less clear than it should be, after all the continuing discussion of the relevance of ordinary language and everyday assignments, what the intuitive data does show. What it does indicate is that a theory makes the assignment true to (1)-(4) is likely, other things being equal, to approximate decidedly better to the data that a logical theory of discourse (and language and thought) has to take account of than one that does not. And this will be confirmed as the theory unfolds.

Meinong's view, that

> though it is not a fact that the golden mountain or
> the round square exists, ... it is unquestionably a
> fact that the golden mountain is golden and mountainous,
> and that the round square is both round and square.

undoubtedly, as Findlay goes on to remark (63, pp. 43-4), enjoys much initial plausibility. Thus if appeals to plausibility and to ordinary intuitions and assignments are to carry any weight, a theory which would bring out (1)-(4) as true would seem preferable to a theory like Russell's theory which assigns these value false, and a theory which assigns some truth-value decidedly preferable to one which assigns none.

Whatever the intuitive assignments, some values must be assigned to each of (1) to (4) - even if the value assigned is, for example, X - for does not arise, neither true nor false, (truth-value) gap, or the like. For the sentences concerned do express propositions, since what they express can, quite unproblematically, be believed, denied, inferred, and so forth. These propositions must be either true or false or, should bivalence fail, X. But the theories based on the last assignment are not (as already argued in §2) nearly as well-supported as bivalence for propositions, or, what usually corresponds syntactically, the law of excluded middle: nor have they been worked out in requisite detail. For example, where X represents the value, does not arise, even the truth-tables for sentential connectives like '&' and 'or' remain in some doubt. This naturally increases the difficulty of arguing against the adoption of such an assignment. It appears, however, that many logical anomalies would result, especially over negation and existence, over intensional functions, and over the interconnection of conditionality and consequence, and that intuitively acceptable arguments would be destroyed, including e.g., the Tarski biconditionals such as that A is true iff A.[1] In any case the assignment of X violates a version of the independence principle; for whether it is true or X that Kingfrance is king depends just on whether Kingfrance exists. Similarly the assignment of false to (4) violates such an independence principle. For if (4) is analytic-like when the existence requirement is satisfied, then (4) should hold when the existence requirement is not met - if the having of characterising features is to be properly independent of existence.

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[1] On the latter points see, e.g. van Fraassen 66, p.492 and p.494. On the former see, e.g. Nerlich 65.

Which of the values, true or false, is assigned to each of (1)-(4) cannot be settled by empirical investigations; for the intended subjects are not to be located in ordinary space-time. The issue, in some ways like a conflict issue, has to be resolved - since (pace Strawson 64, p.106) resolved it needs to be for logical theory - by other means, by logical and theoretical principles and considerations. Some arguments and factors which weigh in favour of the assignment true to each of (1)-(4) will next be developed. How if the value false is assigned to (1) can one satisfactorily argue by direct methods, that Meinong's squound (i.e. round square) does not exist? The intuitive argument would run:
Meinong's squound is round: Meinong's squound is not round.
Therefore, since an item which is both round and not round does not exist, Meinong's squound does not exist. An assignment of the value false to (1) and (2) would destroy this very natural argument; for false premisses cannot be detached. The classical argument for the nonexistence of Meinong's squound is either unsatisfactorily indirect - it supposes that Meinong's squound does exist and then applies the CP for entities - or else introduces, what is in fact at issue, a theory of descriptions which analyses Meinong's squound away. Less intuitive arguments to establish the non-existence of Meinong's squound also meet difficulties. Suppose it is argued: It is false that Meinong's squound is round; it is false that Meinong's squound is not round. If it is false that an item is round and false that it is not round then the item does not exist. Therefore Meinong's squound does not exist. But first, the last stage of this argument would be unable to discriminate between Kingfrance and Meinong's squound; between the possibility of the first and the impossibility of the second. Secondly, how is it concluded that the statement "Meinong's squound is round" is false? On the theory we should have already to know, what we are trying to establish, that Meinong's squound does not exist. An unpleasant circularity appears in the argument. With the CP such problems are avoided.

There remain other plausible arguments for the CP, upon which however even less weight can be put, for two reasons. Firstly, they are easily faulted by devices that have been long developed and refined by the opposition to meet such arguments. Secondly, the arguments, unless qualified in a way that begins to interfere with their plausibility can do too much, e.g. by pointing to unguarded versions of the CP. One such simple argument for (1) runs as follows:- Let x be a subject variable. Now if x is Meinong's round square, then x is round and square, by the logic of predicate modification. Therefore, by simplification, x is round. Therefore, since Meinong's round square is Meinong's round square, it is true that Meinong's round square is round. This follows by generalisation upon "x is Meinong's round square, so x is round", and by instantiation with "Meinong's round square". Similar initially appealing arguments can be devised for the truth of (2)-(4). There are, however, orthodox ways of blocking these arguments, for example, by distinguishing identity from predication, and denying Kingfrance is Kingfrance, and more generally b = b where b is a non-entity.

Finally (1)-(4) may be defended by appeal to the sense of component expressions. For instance, the description 'the golden mountain' has a sense, since it is subject component of (3), and (3) is significant and has a sense.

By 'the golden mountain' is meant 'the mountain which is golden', in other words 'the mountain of which it is true that it is golden'. But mustn't it be true of *this* mountain that it is golden? If so, (3) is true. Generally, if characterising feature f holds of a in virtue of the sense of 'a', then af is true.

Like the Independence Thesis, the Characterisation Postulate has several controversial consequences of substantial philosophical interest. One is the *Advanced Independence Thesis*, that nonentities commonly have a nature, a more or less determinate nature. For appropriately characterised nonentities will be assigned natures by the CP, inasmuch as each is credited with a set of (necessarily held) extensional features. The amalgamation of the features of a given set can be said, not implausibly, to furnish the (extensional) *nature* of the nonentity whose set it is. Plainly many such nonentities will have rather indeterminate natures, since their characterisations leave many respects undetermined. For instance, the round square is indeterminate as to the length of its side, as to its diameter, as to its colour and in most other respects, its nature being given by the features of roundness and squareness and their joint consequences. Nonetheless some nonentities, e.g. geometrical objects of mathematical interest such as the Euclidean triangle and all regular polyhedra, have quite rich, even if simple and austere, natures. It should be observed that 'nature' is being used in precisely the relevant dictionary sense, according to which an object's nature is the 'thing's essential qualities' (see OED), or, a little more broadly, the thing's essential and characteristic features. Given an object's nature, it is possible to specify (by deductive closure) the object's *essence*, i.e. 'all that makes a thing what it is' (OED again).

An outcome of the Advanced Independence Thesis (AIT) is that the issue separating existentialism and neo-thomism as to whether existence precedes essence, or vice versa, is settled, by noneism, if not exactly in favour of the neo-thomism, *against* existentialism. The core existentialist thesis[1] that existence precedes essence is false. For, firstly, a nonentity may, by the AIT, have a definite nature though it does not exist. The existence of an impossible object, such as Rapseq, cannot precede its essence, in any satisfactory sense of 'precede', since it has an essence without ever existing. Secondly, in order to determine whether a thing exists or not, to seek it out or look for it, we commonly need to know *what* it is: essence is, in this respect, epistemologically prior to existence. None of this is to deny that existence often makes a *substantial* difference to an object and to its character; e.g. removal of existence by death or destruction can make the difference between a lively energetic creature and a lifeless object that was, (even briefly), before, that creature.

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> Moreover, as Sartre and numerous others have repeatedly insisted, there is, in fact, no need for all this vagueness and obscurity [as to what existentialism is , since an extremely simple, literal, and precise definition of existential philosophy is easy to come by and easy to remember. Existentialism is the philosophy which declares as its first principle that existence is prior to essence. (Grene 59, p.2).

The claims made on behalf of this definition, that it is simple, literal and precise, are hardly to be taken seriously, as an attempt to spell out the slogan soon reveals. The existential first principle, for example, upon called for elucidation, turns into, among other things, the obnoxious chauvinistic value thesis that the particular fact of individual *human* existence ranks above practically all else, certainly above all connected with essences and species.

Not only does existence not precede essence, but existence is never an essential or characterising property of objects (of course it can be a distinctive feature of something that it exists). So emerges Meinong's contingency axiom, $\sim\Box xE$, nothing necessarily exists. The axiom is not however a consequence of the CP or restrictions upon it, though the restrictions upon it are an important part of the case for the axiom. For the restrictions block the main (and, so it will emerge, basic) logical way in which necessary existence of an object might be established. Conversely, the axiom forces restrictions on the CP, notably the exclusion of existence as an assumptible feature. For suppose that an item a's having some characterising property entailed that a exists. Since items have their properties necessarily it would follow that a necessarily exists, contradicting the axiom. The axiom itself may be defended in a quasi-semantical way:- Consider any item a at all; then a consistent situation can be envisaged or imagined without a, or where a does not exist. But the fuller case for the axiom must wait upon the analysis of existence, and the exclusion of other ways of establishing necessary existence than by assumption principles.

The scholastic thesis that essence does not involve existence, where involvement is construed as entailment - a consequence of the thesis that essence is logically prior to (or precedes) existence - does emerge then: but in a qualified form, where an object's essence is construed narrowly in terms of its necessary features (the OED construal of essence properly allows for non-necessary nomic features). For the essence of an item comprises some sum or conjunction of the essential (usually necessarily held) properties of an item; and an item's having these properties does not, by the contingency axiom, entail that it exists.[1]

It is the Advanced Independence Thesis, not the Independence Thesis, that entitles one to apply such terms as 'object' and 'thing' to talk of nonentities: for in virtue of the AIT nonentities are thinglike and have a character. Strictly speaking then, the AIT is required in making good the distinctive thesis M2 of Meinong's theory that very many objects do not exist in any way at all. Without the AIT it could be plausibly contended that Meinongian-objects are not really objects. Given the AIT such a contention is hard to sustain, except through an illicit high redefinition of 'object', e.g. as 'entity'.

But the most important consequence of the AIT and IT is that the Reference Theory, a pervasive and insidious philosophical theory, is false.

§6. *The fundamental error: the Reference Theory.* The Ontological Assumption is a major ingredient of the Reference Theory of meaning, according to which all (primary) truth-valued discourse is referential. For the Ontological Assumption claims, what is part of the Reference Theory, that in order to say anything true about an item its name or description must have an actual reference. Not only has there been a failure to appreciate the true nature of the Ontological Assumption; worse, theories which, like Meinong's, reject the Ontological Assumption are commonly accused of embodying the Reference Theory. This inversion of the true state of affairs is due to a serious confusion as to what the Reference Theory amounts to. Part of this confusion is due to an ambiguity in the use of the word 'refer' (and likewise in the German 'Bedeutung'). The word 'refer' is used in everyday English (see OED), in the relevant sense, to indicate merely the subject or topic of discourse, or subject-matter, or even more loosely what such discourse touched upon or what was drawn attention to or mentioned. Any subject of discourse can count as referred to, including nonentities of diverse kinds; in this sense there is no commitment to existence. Superimposed on this non-theoretical usage we have a philosophers' usage which embodies theoretical assumptions about language, according to which the reference of a subject expression is some existing item (an extensionally characterised entity) in the actual world.

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[1] Some of the traditional arguments for the scholastic thesis also support the Independence Thesis. For instance, the argument that finite items may come into existence (in this sense their essence literally precedes their existence) and cease to exist without thereby gaining and losing their essence, does show that the essential properties of an item, as distinct from contingent (status) properties such as coming into existence, do not conjointly entail existence of the item.

The assumption that the two usages, the everyday and the philosophers', are coextensive smuggles in, superficially as a matter of terminology, an important and highly questionable thesis about language and truth. If one wishes to reject the assumptions made in identifying these two relations, one must adopt terminology which makes it possible to distinguish them: in the circumstances there seems little alternative but to henceforth reserve the term 'refer', which has become loaded with assumptions as to existence and transparency, for the restricted relation and to adopt some of the other less spoilt terminological alternatives for the wider mentioning relation. Another reason for confining 'refer' to the more restricted relation is that in this way one preserves the standard contrast between sense and reference which is important in two factor theories of meaning. So we shall say that 'a' has a reference only where a exists;[1] otherwise 'a' is about, signifies, or designates, a, though a need not exist or be appropriately shorn down to have only transparent features. The point of the distinction is to allow for the fact that to use 'a' as a proper subject of a true statement is not necessarily to use it to refer (in the philosophers' sense). The distinction is important because it is precisely the identification of aboutness and reference that leads to the Reference Theory, according to which all proper use of subject expressions in true or false statements is referential use, use to refer, and thus according to which truth and falsity can be entirely accounted for, semantically, in terms of reference to entities in the actual world. That is, the only factor which determines truth is reference: at bottom the truth of 'af' is determined by the reference of the subject expression 'a' having the relevant property specified by 'f'. In contrast the distinction allows for the correct use of a subject in a true statement, as about an object, which is not use to refer and which can be made in the absence of reference, e.g. where the item does not exist.

The Reference Theory has often been characterised as the view that the meaning of a word is its reference or bearer, or that all genuine uses of words are to refer. What we shall take as our starting point however is a more prevalent, and plausible, special case of this view, namely that the meaning or interpretation of a subject expression in truth-valued discourse is its referent. The reason for so restricting what is meant by 'the

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[1] The formal theory is developed in Slog, chapter 3. Observe that occasionally quote marks are used as quotation functions, much as Russell uses them in OD.

Reference Theory' is that liberal characterisations of the theory have encouraged the belief that the Reference Theory has been escaped once the extreme view that such syncategorematic expressions as connectives must refer has been abandoned, or once the Descriptive Thesis - that is, that all discourse can be reduced to truth-valued discourse - has been rejected. Non-descriptive discourse provides clear prima facie examples of uses of expressions which are not referring ones, and it has been supposed that rejection of the Descriptive Thesis is sufficient to guarantee that the fallacy, that all genuine use is use to refer, is avoided. But abandoning just the Descriptive Thesis is not enough, because the Reference Theory is not adequate even as an account of meaning or truth in truth-valued discourse.[1]

Nor is the Reference Theory adequately characterised as the belief that the meaning of a word is its reference or bearer. First, such a characterisation is too psychological, and gives no clear logical criterion for when the Reference Theory is being assumed. Second, such characterisation is too liberal: the formulation of the Reference Theory must be restricted to subject terms and names, and not applied to all connectives and predicate components. Otherwise, the reference theorist is a straw-man; scarcely anyone (before modern semantical analysis in terms of functions) held the doctrine that the meaning of a connective like 'but' is some entity it refers to, certainly not such prime targets as Augustine or Mill. Adequately characterised the Reference Theory is a much less simple-minded, and more pervasive doctrine. The (simple) Reference Theory is better characterised by the rejection, in one way or another, of all discourse which (whose truth and meaning) cannot be explained on the hypothesis that the meaning or interpretation of a subject term is its reference, that is of all discourse, where use is made of subject terms other than to refer.

The Reference Theory (RT for short) is often presented as a theory of meaning rather than of truth, as the theory that the meaning of an expression is its reference or - a more sophisticated version - that the meaning of a subject expression is given by, or is a function of, its reference. The connection between these two versions of the RT comes about through the connection between meaning and truth in truth-valued discourse (as explained, for example, by Davidson and by Hintikka; see Davis et al 69). The connection is that the meaning of 'a' is a function of (is given by) the true statements in which it occurs as subject, its use in true statements; but if the truth of such statements is a function of 'a''s reference 'a''s meaning will also be just a function of its reference. The converse is obvious, because if the meaning of 'a' is thus determined by 'a''s reference, the truth of statements about a will always be determined just by reference. What usually contrasts with both these versions of the Reference Theory are second factor theories of meaning and truth which assume that these features are not just a function of reference but that there is a second factor which can determine truth along with reference.

According to the Reference Theory, as it applies to truth-valued discourse, all truth (and falsity) can be accounted for just in terms of the attributes of referents of subject expressions; succinctly, truth is a function of reference. In discounting entirely the legitimacy of using a subject in other than referring ways to determine the truth of some statements it is forced to reject all discourse which does not comply with its restrictions.

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[1] Thus we go substantially beyond the position that the work of Wittgenstein and of Austin has suggested to many, that the Reference Theory is not adequate as an account of meaning because it is not adequate to explain the meanings of terms in non-descriptive discourse and in discourse that is not truth-valued, to the much stronger claim that the Reference Theory is far from adequate as an account of meaning in descriptive truth-valued discourse.

What is meant by the 'rejection' of such discourse by the Reference Theory? The naive Reference Theory begins with the factual thesis that all discourse conforms to the referential structure it describes. Because no failure to observe it is envisaged, there is no question of classifying violations of referential structure. As this position cannot be maintained for long in the face of the many counterexamples, the theory is variously reformulated to classify these violations, in order to provide a rationale for their rejection. Different strains of the Reference Theory result according to how such classifications are made. Violations are variously rejected as unutterable or literally impossible (the naive position), unintelligible, meaningless, lacking in precise meaning, false, truthvalueless, illogical, unscientific, or simply not worth bothering about. Of these variants the rejection as meaningless has been singled out by opponents of what is sometimes called 'the Reference Theory' for derision, as the Reference Theory of Meaning - because a term without a reference must be without a meaning, on the theory, so that any compound in which it occurs is meaningless. But it is the whole reference picture that is wrong and not just the particular version of it which sees conformity with the picture as necessary for meaningfulness. Since the picture as a whole is mistaken, differences among the rejections are comparatively unimportant; and it suffices to consider the weakest of these positions, which rejects violations as not truths which need be encompassed in any logical theory. For logical purposes, this reduces to not being true.

Because there are two aspects to reference - having a reference, with its correlate, existence, and having one and the same reference, with its correlate, identity - there are correspondingly two types of truth-valued discourse rejected, in some style or other, by the Reference Theory, first that where the subject expression lacks reference altogether, second that where the predicate is referentially opaque. The first of these, which involves the rejection as false, or worse, of all discourse where the subject does not exist, amounts to the Ontological Assumption. It is clear why true statements about nonentities must be eliminated under the Reference Theory; because subject terms lack reference where the objects they are about do not exist, the truth of true statements about nonentities could not be determined just by reference. Hence too the not uncommon corollaries of the Ontological Assumption, that, since in the absence of reference there is nothing to determine truth, one can say whatever one fancies about nonentities. If on the other hand, truth is not merely a function of reference but of some other factor as well, there would be no need to automatically reject - and no such case for rejecting - such discourse simply because reference is absent. The Ontological Assumption is then a major component of the Reference Theory.

The second important component of the Reference Theory is the rejection or elimination of referentially opaque predicates and of discourse in which they appear, that is of statements which attribute distinct properties to (referentially) identical entities. Since on the Reference Theory, 'a' and 'b' have one and the same reference iff a and b are identical, this component amounts to the Indiscernibility of Identicals Assumption (the IIA). For to conclude from the identity of reference between 'a' and 'b' that there is exactly the same class of true statements about a and b is already to have assumed that reference is the only factor which determines truth. For it is only if reference is the sole determinant of truth that sameness of reference of 'a' and 'b' can guarantee that the same class of true statements hold of a and b. To reject the Reference Theory then one would need to restrict the Indiscernibility Assumption and its consequence that all "genuine" properties are referentially transparent, that is, are properties of the referent.

Many of the unsatisfactory and restrictive features of the classical logical analysis of discourse derive from the Reference Theory. Because of the Ontological Assumption the quantifiers and descriptors tolerated by the Reference Theory must be existentially loaded, that is the objects over which the variables and quantifiers range (in the usual referential sense of 'range') must exist, and the domains of quantification must be domains of entities. For in standard logics where Universal Instantiation is valid, counterexamples to the Ontological Assumption could be generated if there were in the domain of quantification items which did not exist. By instantiating a principle which holds universally, a corresponding property would be ascribed to such a non-existent item, contradicting the Ontological Assumption.

Because of the Indiscernibility Assumption, sentence connectives allowed by the Reference Theory are effectively restricted to extensional connectives, that is to connectives which have the same truth-value when a component is replaced by another component with the same truth-value. For if intensional connectives were permitted contexts could be devised using connectives in combination with predicates to violate the Indiscernibility Assumption. For example, if the intensional connective 'necessarily' is admitted it is easy to construct opaque predicates such as 'is necessarily identical with Aristotle'. Similarly because of the Indiscernibility Assumption the quantifiers permitted must be transparent, they must 'range over' referents, so that substitution of expressions having the same reference (so-called 'substitution of identicals') does not affect truth-value assignments. The joint requirements on quantifiers of existential-loading and transparency are especially clear in the reading for quantifiers that Quine proposes (WO, pp. 162-3), where the universal quantifier '(x)' is read effectively as 'everything is (=) an entity x such that'. A sufficient condition, in fact for a slab of discourse to be referential is that it be adequately expressible in the canonical notation of Quine's interpretation of quantificational logic with identity (as given, e.g. in WO).

The Reference Theory has a great many indirect or disguised forms and manifestations, many of which are more plausible or at least less clearly falsifiable than the original. Thus the Reference Theory is often employed at a level prior to formalisation to determine "logical form" or "deep structure". Modern grammatical analysis (at least in its mainline form) preserves the Reference Theory by requiring that sentences in deep structure meet referential requirements and by employing an identity of reference test as a criterion of ambiguity to separate off apparent counterexamples. In much the same way classical logical analysis of discourse protects the referential assumptions of classical logic from direct falsification by requiring that sentences be transformed to consist of subject-predicate forms combined by connectives and quantifiers, where the subjects designate entities, the predicates are transparent, the connectives are extensional, and the quantifiers are transparent and existential. A sentence meeting these requirements is in canonical form, or Quinese (the canonical language of WO). Thus the Reference Theory dictates, through canonical form, what discourse classical logic attempts to deal with. For example, where canonical form is used to determine the genuineness of a property, the Reference Theory is being used as a criterion of the admissibility of predicates. Thus it is claimed, for instance, that intensional predicates cannot provide "genuine" properties because they are referentially opaque, whereas a "genuine" property must be true of its subject however that subject is described. But such a criterion for genuineness of property would be correct only if descriptions merely having the same reference have precisely the same function, and could be used interchangeably for one another, that is the criterion would be correct only if the sole legitimate function of a description is to refer - in short, if the Reference Theory is correct. In a parallel way the Reference Theory is applied to determine, prior to formalisation, the "real" or "logical" subject of a statement, what the statement is "really about": this is done by way of existence and identity tests which ensure that real subjects are used referentially. For example, if an apparent subject does not refer to an entity, it cannot be the "real" subject. "Real" or "proper" subjects, like "genuine" properties, are those which accord with the Reference Theory.

Thus too the Reference Theory is employed semantically to determine basic semantical notions and to ensure that semantical notions conform, i.e. are properly behaved and intelligible. Given the basic - neutral - account of truth (derived in Slog, section 3.7), according to which the statement that xf is true iff what 'x' is about, i.e. the individual (or item) x, has property f, a referential account of any one of these operative notions will carry over to the others. Hence there are three points at which the RT can be infiltrated into semantics, with the notions of truth, property or individual. The use of a referential account of individual is basic to the RT. The RT takes the subjects of discourse or individuals to be references; for given the RT, since truth is a function of reference, and the truths about an individual determine it, the individual can be nothing but a reference. This is also equivalent to taking the aboutness relation to be a reference relation, which as we noticed was a source of the RT. When the individual or subject of discourse is conceived in this way, as the sum of its reference-determined properties, i.e. as a reference, the notion of an individual which does not exist but which has some properties, is unintelligible. If on the other hand the individual has, like Meinong's object, properties which are not determined by reference, then it cannot merely be a reference. Hence it is possible to reject the notion that the individual is just a reference, the sum of its reference-determined properties, and to allow it to be a synthesis of these properties (if it has them) and further properties which are not reference determined, e.g. intensional properties, without abandoning the basic truth schema. Adoption of the basic truth schema, then, need not commit us to the RT unless we import referential assumptions into our accounts of individual, property or aboutness (subjecthood).

But classical semantics does adopt such reference-based accounts of these notions. Hence not only classical logic but also the classical semantics delineated by Tarski and others is derived from, and hence conforms to the Reference Theory. And according to classical semantics, meaning can be completely explained in terms of, and semantics exhaustively done in terms of, just the two related notions of reference and truth (or satisfaction) in the actual empirical situation. Although classical semantics is a covert way of enforcing the unquestioned requirements of the Reference Theory, it is widely regarded as providing, not just a semantics for classical logic, but a general semantical framework for all intelligible logical systems. Thus explanability in terms of a semantics which meets referential requirements becomes a condition of adequacy for a theory, as in the work of modern empiricists (e.g. Davidson). When the Reference Theory is used in this way as a condition of adequacy and to determine the problems, it is not only unfalsifiable, its rejection becomes almost unthinkable. Hence also a further disguised form of the Reference Theory: it is employed as a criterion of adequacy on satisfactory solutions of problems (often generated by the theory itself), e.g. such problems as quantifying in, mass terms, predicate modification, and so on.

1.6 THE REFERENCE THEORY IN CLASSICAL LOGIC AND IN EMPIRICISM

The Reference Theory influences and shapes not only logical theory but other parts of philosophy, in particular epistemology. For an epistemological correlate of the Reference Theory is empiricism. Briefly the connections (which are spelt out more fully subsequently) are these. According to the Reference Theory the basis or origin of truth is always reference. What correlates epistemologically with the origin of truth is how we come to know it. Thus how we come to know truth, to knowledge, is always by reference, from entities and their transparent properties. But these we have access to ultimately only by sense experience. Hence all knowledge derives ultimately from sense-experience, which is the main thesis of empiricism. In undermining the Reference Theory one accordingly undermines, at the same time, empiricism.

Although the assumptions of the Reference Theory now seems to most philosophers, particularly those brought up in a thoroughgoing empiricist climate, to be simply philosophical commonsense, it is clear enough that the systematic set of assumptions amounts to a theory, even if a very basic and general - and mostly unquestioned - one, about language and truth. Like any theory it must meet the test of accounting for the data, and this it fails to do.

The Reference Theory - although basic to and enshrined in classical logic and semantics, and incorporated in much modern linguistic theory and most modern philosophy of language - is wrong. It is not wrong, however, in the simple straightforward way that is sometimes imagined. Firstly, although exaggerated characterisation may have made it appear so, the Reference Theory is neither internally inconsistent or ludicrous. For a not unimportant fragment of discourse is referential and for that fragment the Reference Theory can provide a coherent account of such notions as object and truth.[1] Secondly, there is a large repertoire of devices for extending the range of the Reference Theory to encompass matters that would, perhaps, at first sight, seem beyond its scope. Thus if what can be expressed in the initially given canonical forms of the Reference Theory seems excessively restricted, an array of devices, still conforming with the Reference Theory, is available for extending the effective class of canonical forms. Foremost among these are theories of descriptions, set-theoretical reductions, and levels of language theories.[2] A great deal of enterprise and ingenuity has been spent - not entirely wasted - on trying to fit parts of non-referential discourse that are thought to matter into the Reference Theory; witness, in particular, the variety of paraphrases of (limited parts of) intensional discourse that have been proposed with the object of maintaining Leibnitz identity assumptions. Nevertheless despite all the auxiliary equipment for extending its range, the Reference Theory is wrong, for much the usual reason, that it cannot account adequately for the data. There are many true statements of natural language whose truth cannot be reconciled with the Reference Theory and the standard ways of attempting to reconcile them with the Reference Theory involve unacceptable distortion (as will be argued in detail). These include both statements about nonentities and intensional statements; and they serve to falsify both the OA and the ITA. To reject such cases on the grounds that they do not comply with the Reference Theory or its logical reflection, classical logic and classical semantics, is to make that theory prescriptive and unfalsifiable. Similarly saving the Reference Theory at the cost of saying that the theory of meaning and truth embodied in natural discourse is mistaken is like claiming that the world embodies a mistaken theory of physics. The test for correctness of a theory of meaning and truth is its ability to give an adequate explanation of meaning and truth in natural language; any theory of meaning and truth which depends on dismissing or distorting as many important and ineliminable features of natural language as the Reference Theory does, must be mistaken, and should be superseded.

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[1] Thus for limited purposes classical logic can be adopted, and it can be included as a restricted sublogic of whatever alternative logic repudiation of the RT forces one to.

[2] Many of these strategies for extending the RT are criticised in subsequent sections. There are of course parallel strategies designed to encompass knowledge which is not empirically derived within empiricism, and so also strategies to reduce concepts not of an empiricist cast to constructs from empirically-admissible components.

To accommodate, in the superseding theory, both sorts of uses of subjects, referential and nonreferential, and to make the differences explicit, the procedure already adopted (in §3), of explicitly removing (contextual) referential assumptions from example sentences, is extended. Henceforth subjects both in example sentences and in symbolic expressions are assumed not to occur referentially, unless referential loading is specifically shown or specifically stated or contextually indicated. The case where subjects do occur referentially can be represented symbolically by superscripting such subjects with symbol 'R'. So, for example, Hobbes' inference

I^R walk; therefore I exist

is admissible; but the inference fails if the premiss is replaced by the unsubscripted premiss 'I walk'. Similarly the inference

I^R exist; therefore RR exists

is admissible, since the contingent I = RR is built into the premiss. But the inference

Necessarily I exist; therefore necessarily RR exists

is not, since extensional identities are not generally replaceable in intensional contexts (contra Vendler 76; the point is elaborated later).

With this procedure the extrapolation (already begun in the existential case) from natural language, which sometimes is referential, continues. In the interests of theoretical organisation and explanation, and a uniform logical theory, a shift is made to a natural extension of workaday language where referential assumptions are dropped in all sentence contexts unless explicitly indicated by superscripting or by the context of use. The theoretical point can be put in this way: though in surface linguistic structures both referential and nonreferential discourse occur, in deeper analysis only nonreferential forms are admitted and associated referential assumptions appear explicitly. In particular, then, deeper structure is not referential; and accordingly the logic of deeper structures of natural language is not classical. It cannot be pretended that the procedure for detecting referential usage in ordinary discourse and transforming it to nonreferential usage is so far anything like an effective one. But then neither is the procedure, on which the first procedure can be made to depend, for symbolically transcribing natural language arguments and sentences. Given that referentialness of usage in symbolic transcription is stated, rather than implied by or in the context, superscripting can then be eliminated in favour of specific statement of referential requirements by way, as a very first approximation, of logical equivalences such as:

$x^{R}f \equiv.\ xf \ \&\ xE \ \&\ (y)(x = y \supset.\ yf)$. But, as remarked, referential use in natural language appears not be stated but rather indicated or implied by the context of the expression.[1] The fact that underlying use is nonreferential is not a limiting factor in what can be expressed. Features of referential use can be stated or contextually exhibited.

In a historical search for a new theory to supersede the Reference Theory, there is no better place to begin than with Meinong's work. For Meinong's theory of objects represents the most thoroughgoing rejection of the Reference Theory that has so far been seen, surpassing even that of Reid 1895 and the later Wittgenstein 53. In rejecting the Ontological Assumption Meinong was rejecting the major and characteristic thesis of the Reference Theory. But he did not stop there. He also cut through important ramifications of the Reference Theory such as the restriction of quantification (and correspondingly other logical operations) to referential modes of use, the rejection of intensional properties as genuine properties, and most importantly, the identification of the object (and proper subject) of a true statement with reference. Much of Meinong's theory can be viewed as an attempt to develop a phenomenological theory of the use of subjects in nonreferential discourse, which does not depend on reducing this discourse or equating it with referential discourse, or, what is equivalent, equating the subjects of such discourse with references.

If the accounts given of the real character of the Reference Theory and of the leading features of Meinong's theory of objects are anywhere near the mark, then there is no justice in attributing the Reference Theory to Meinong. Yet according to a criticism, apparently originating with Ryle (in 33; also in 71, p.353 and p.360 ff; and in 72) and now part of conventional Oxford wisdom, Meinong's theory is an extreme application of the naive 'Fido'-Fido theory of meaning (FT), generally identified with the Reference Theory. Thus it is claimed that Meinong assumed the FT in assuming that to every meaningful subject 'a' some object corresponds. According to Ryle this commits Meinong to the

> full-fledged doctrine that to every significant grammatical subject there must correspond an appropriate denotation in the way in which Fido answers to the name 'Fido' (71, pp. 360-361).

As so explained by Ryle the FT seems just to amount to a version of the RT; but perhaps we can better characterise what Ryle intends by the FT as the doctrine that any subject 'a' has a denotation if it has a meaning and this denotation a determines the meaning of 'a'. But once specified in this way it is plain that the FT and the notion of denotation particularly partake of the same ambiguity as the notions of reference and the notion of object, and on the basis of this ambiguity one can construct a dilemma for this criticism.

For either 'a' is taken to refer to entity a and denotation is taken as reference, or, 'a' is taken to be about a and denotation is not identified with reference or object a with reference a. Under the first alternative the FT is indeed the RT; for it takes meaning to be a total function of reference; but, as we have explained, there is no ground at all for attributing such a view to Meinong. It is quite incorrect to assume, as Ryle does, that in general for Meinong object a answers to 'a' in the way that the entity Fido answers to the name 'Fido'. There is of course more than one way in which Fido answers to the name 'Fido', and only one of them is a reference-relation. Another is the aboutness relation, the general relation between 'a' and a. But since

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[1] Where context is taken into account in the semantical evaluation referentialness of use can be supplied as a component of context; as to how, see Slog 7.2. §8).

Ryle clearly takes "the" relation to be of the former variety, he has made the incorrect assumption that the objects of Meinong's theory are references and that the relation of denotation between 'a' and a must be, and is for Meinong, a reference relation. Ryle, in assuming that all these relations must inevitably be referential, has proceeded to make assumptions drawn from the very theory he is denigrating, the RT, and then to use these assumptions in redescribing Meinong's theory, despite the fact that Meinong rejected them. Not surprisingly it is then a simple matter to "convict" Meinong of ridiculous and extravagant versions of the RT, and to represent Meinong as, for example, 'the supreme entity-multiplier in the history of philosophy' (33, our italics). The inability of critics of Meinong who employ this sort of technique (e.g. Russell 05, Carnap 56, Ryle, Bergmann 67 and Grossmann 74), to see how logical relations such as that between 'a' and a, and quantification, could be other referential relations, how objects could be other than entities, is itself sufficient indication of the grip of the RT.

To take the other horn of the dilemma, once the aboutness relation between 'a' and a is distinguished from reference it is possible to construct a version of the FT which can be correctly attributed to Meinong, but there is no longer anything objectionable about such a doctrine, and it does not imply the RT. For once these notions are freed of referential assumptions the "naive" theory becomes - since an object a is described by the subject uses of 'a' in true statements - rather the assumption (U) that for every meaningful subject 'a' there are (nonquotational) uses of 'a' as the proper subject of true statements and that these uses which are about a determine the meaning of 'a'.[1] This is simply an innocuous and neutral use theory of meaning, and one can only move from such a theory to the Reference Theory by assuming that all use of proper subjects is use to refer, which of course amounts to the Reference Theory itself.

Thus Ryle, in attempting to convict Meinong of holding the FT formulation of the RT, actually succeeds in completely inverting the true state-of-affairs; for not only does he accuse Meinong of accepting a theory of which Meinong is a main opponent, but he champions Russell (in 71, pp. 361-5) as one who escaped the pitfalls of Meinong's stone-age theory of meaning. But in fact it is Russell who is committed to the RT, both for truth and for meaning (as 05 reveals). The truth version of the RT is an immediate consequence of the OA and the IA, both of which are important ingredients of Russell's theory (vide PM); and the meaning version is derivable from the truth version, given the connection between meaning and truth, e.g. as expressed in principle (U), or obtained thus: the meaning of subject expression 'a' is a function of truths about a, which in turn are functions of the reference of 'a', so meaning is a total function of reference. From these RT principles follows the damaging FT, that a proper subject 'a' has a meaning only if it has a reference and that this reference determines the meaning.

Ryle argues, however, that Russell escapes the damaging FT because his distinction between apparent subjects and proper subjects enables him to allow a meaning to the former in the absence of reference. But apparent subjects only obtain a meaning and a use in true statements in a quite secondary, indeed a second-class, way, via their elimination in favour of subjects which do have references. Hence the thesis that meaning is a function of reference is not abandoned at all in Russell's theory: the distinction between apparent and proper subjects is merely used to enlarge the class of statements which can be 'analysed' as having referential subjects (cf. too the modern referential programs, e.g. those of Quine FLP and Davidson 69). Neither Russell's theory nor its subsequent elaborations and variations, despite their appearance of greater liberality, escape the Reference Theory; for nonreferential uses only manage to squeeze in, where they do, by being eliminated or reduced, and very roughly at that, in favour of referential uses.

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[1] For the corresponding formal theory, see Slog, chapter 3, a theory further developed in UTM.

The effect of abandoning the Reference Theory (and its elaborations) is one of logical liberation, and thereby (as we will come to see) of substantial philosophical liberation. Why then has it persisted?[1] Its persistence can be explained by a complex combination of circumstances (to be elaborated somewhat in what follows):- Firstly, its linkage with empiricist-verification theses (whether in individualist or class form)[2]. Secondly, connected with the first, the linkage (already explained) with classical logic and semantics. Thirdly, its initial simplicity, and its extendibility. Fourthly, because there is a correct theory, a denotational-type theory of meaning, closely allied to the Reference Theory which tends to reinforce it (see SMM and UM). And how can the persistence of the Reference Theory be annulled? Not easily: many of those caught in the grip of the Reference Theory fail to see how there could be any alternative to it, how truth, and meaning, could be explained otherwise than in terms of reference. But the inadequacies of the Reference Theory have already pointed in the direction of an escape from the Theory, initially through elaborations (embroidery, so to speak) of the Theory itself, through Double and Multiple Reference Theories, but eventually in ways that break free of persisting referential assumptions altogether.

§7. *Second factor alternatives to the Reference Theory and their transcendence.* In contrast to the Reference Theory, the theory of items rejects the thesis that meaning is a function of reference, recognizing (at least) a second independent mode of use of subject-expressions which is different from referential use and not reducible to it.[3] Given such a "two factor theory" the possession of properties in the absence of reference or referential identity can be readily explained, if we assume, unlike Frege, that the second factor can operate to determine truth in the absence of reference, not merely in addition to it. On this account the two different factors yield two different ways of determining truth about the same object; they provide two important but different ways, a referential and a nonreferential way, of using the same subject. Theories which allow for two different forms of use, forms which can be construed as use and reference factors, can allow for such ways. By contrast the Fregean sense-reference approach still sees just the one way, the referential way, of determining truth, but it sees truths as truths about two different sorts of entities, and sees the second component, sense, as simply providing an auxiliary

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[1] And why, for many, does remaining liberated require constant vigilance against the insinuation of the Theory in one way or another, e.g. through calls for analyses and reductions within its terms?

[2] These connections are traced in chapter 9.

[3] Meinong can (on a very generous construal) be taken as reaching for such a two factor theory in his distinction between Sein and Sosein, that is between 'x''s having a reference and x's having a property; this distinction clearly allows a second mode of use of 'x', as proper subject of a true statement, which is not, and not reducible to, use to refer. This is not the only

(footnote [3] continued on next page)

reference for oblique contexts. Thus the Fregean theory is effectively a Double Reference Theory (DRT) with the concept or sense providing a supplementary reference, but the mechanism is still that of reference. What is right about the DRT is the realisation that a further factor is needed to account for nonreferential uses of subjects. Its mistake is to assume that because an explanation of the truth of such statements must involve a second factor, the statements must refer to this factor. That is, the Double Reference Theory, still in the grip of the Reference Theory, replaces the problematic reference by another entity, the concept associated with it, and then treats the new associated subject as occurring referentially.

It is not difficult to trace a route by which someone, dissatisfied with some of the results and limitations of RT, but perhaps still in the grip of its basic referential assumptions, would arrive at an extended reference theory with further meaning factors entering. Granted, it may be said, that the Reference Theory works (only) for a fragment of discourse, why not try to build on what we have - which is not insubstantial, including an extensive and well-developed logical theory - by introducing a second factor in meaning, which may also determine (or help determine) truth? Then if we add the truths determined by this second component to those determined by reference, we might get a complete picture of truth and meaning. In this way we can keep the Reference Theory as a correct account for referential discourse, but extend it, by adding a further ingredient of meaning, to encompass remaining truths and to solve paradoxes of intensionality. For example, if we introduce a second factor, say sense (or use), which is such that two expressions may differ in sense while having the same reference, we have at least the beginning of a solution to the problem of referentially opaque properties, as Frege saw in the case of the morning star-evening star paradox (see Frege 52). With such properties, it is the sense of the subject expression, and not the reference, which determines the truth of the attribution, and hence the property need not apply equally to expressions which simply have the same reference. Similarly, if we were to conceive of this second factor as able to operate in the absence of reference, the fact of true statements about items which do not exist, whose descriptions lack a reference, is no longer incomprehensible.

Although such a second factor theory appears to contain the ingredients for a solution, there are, as we have noticed, distinct ways of developing it. One line, the line noneism takes, sees the two different factors as yielding two different ways of determining truths about the same item; the other, and the main line of development, still sees only the one way, the referential way, of determining truths, but sees these as truths about two different sorts of entities. The basic mechanism for determining truth remains one of reference,[1] and the second component simply provides a further, emergency, reference, which the subject-expression is taken as referring to where the

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(footnote [3] continued from previous page)
distinction from Meinong's theory which bears some resemblance to distinctions of two factor theories. For example, Findlay notes (63, p.184), what seems pretty doubtful,

> that Meinong's distinction between the auxiliary and ultimate object does much the same work as Frege's distinction between Sinn (Sense) and Bedeutung (Reference).

[1] Reference remains dominant on the Fregean account; for sense contains (almost consists of) the mode of presentation of the reference. It is an easy step to replacing sense by the reference presented together with the mode of presentation (whatever that is).

simple Reference Theory will not work. The extension of the simple Reference Theory is obtained by taking cases where the attribution is determined by the sense of the subject expression as cases where the subject expression refers, not to the expected reference, but to the emergency reference, the concept. The basic mechanism is still referential, because once the new references, the concepts, are introduced, every subject again occurs referentially in its context. The main line account is essentially referential: the OA is satisfied, since all concepts are (said to) exist,[1] and apparent counterexamples to full identity replacement are (so it is said) removed. For example, once we have noticed that in nonreferential contexts 'the morning star' refers to the concept Morning Star and 'the evening star' refers to the concept Evening Star, the apparent referential opacity of 'The Babylonians believed that the morning star differs from the evening star' is eliminated. For the identity we should need to show that the context is opaque (namely that the concept Morning Star is identical with the concept Evening Star) now fails. In fact the conditions for identity of concepts are such that all sentence contexts (bar quotational ones) are rendered transparent once the emergency reference is substituted. Similarly once we have replaced statements about Pegasus by statements about the concept Pegasus, apparent exceptions to the Ontological Assumption, such as 'Pegasus is a winged horse, but doesn't exist' are eliminated, since concepts are taken to exist. The Double Reference Theory is thus able to keep the characteristic tenets of the Reference Theory, the Ontological Assumption and the Identity Assumption, and at the same time apparently obtain the desired extension to express nonreferential discourse. But the Double Reference Theory can keep the reference mechanism while having the advantage of the different identity and existence conditions needed to obtain the desired extension of the theory, only because these different identity and existence conditions are provided by replacing, where required, the ordinary subjects by the new ones. Thus the replacement of the ordinary references by emergency references is essential to the Double Reference Theory. But it is just this replacement, and the result that the nonreferential properties which raised problems do not then hold of the same items as referential properties hold of, which is the downfall of the Double Reference Theory.

Firstly, the proposed emergency referents, denoting concepts, do not always have the right properties to replace the original nonreferentially occurring subjects. If, in the first case to consider, the replacement amounts to replacing the original subject 'a' by the emergency subject 'the concept of a', while leaving the original predicate unchanged, the difficulties are obvious. It might be true that Pegasus is a winged horse, but it is obviously not true that the concept of Pegasus is winged. Schliemann searched for Troy, not the concept of Troy, which he scarcely had to go to Turkey to find. For the replacement to work, not merely the original subject term, but also the original predicate, must be transformed.

But new difficulties arise when the predicate is replaced. Although in the case of a necessary truth about a nonentity an obvious transformation of the predicate suggests itself, e.g. 'The concept Horse includes the concept Winged Horse' for 'A winged horse is a horse', there is no such obvious substitute predicate in the case of awkward intensional properties. What is the relation between Schliemann and the concept of Troy, which holds of this concept when and only when Schliemann searches for Troy? There is no obvious candidate. How can we guarantee that there is such a relation, and that it does indeed hold of the concept of Troy, without circularly specifying it as one that holds when and only when the original statement that Schliemann searched for Troy is true? Since the intention was to eliminate, and explain the truth of, 'Schliemann searched for Troy' by reference to this other relation between Schliemann and the concept of Troy, we cannot make the specification of this new relation depend crucially upon the original. Yet it seems impossible, otherwise, to say what the new relation is. But if the new statement depends upon the original for its very specification, it cannot explain this original, much less eliminate it.

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[1] Mysteriously: for where do they exist, and how; and what distinguishes them, and are they identical? The DRT concentrates intensionality in strange entities and then refers to these.

A second difficulty for the Double Reference Theory caused by replacement is that once replacement is made, referential and nonreferential properties no longer hold of the same item. First, this appears quite contrary to the facts of the matter. We can use the same expression referentially and nonreferentially in the one sentence where there is no case for saying it is ambiguous, e.g. in saying that Arthur is both a communist and believed to be a communist, or a known communist. That 'Arthur' is not ambiguous is shown by the fact that we can quantify to obtain 'Someone is such that he is a communist and believed to be a communist'. Indeed it seems an important feature of such properties that they do both hold of the one item, for this explains their relevance to one another. Secondly, no matter how close the relation is between Arthur and the concept of Arthur (a closeness which it is up to the Double Reference Theory to demonstrate), if intensional properties are not really properties of Arthur, Arthur himself is still basically unknowable, unperceivable, not thinkable about, in short, noumenal. The replacement produces a generalised version of the difficulties faced by indirect and representational theories of perception.

A third group of difficulties emerges from iteration features, iteration of intensional functors and corresponding iteration of senses and references. For example, on Frege's theory, expressions in an oblique context have not only an oblique reference (identified with the ordinary sense) but also an oblique sense, which Frege differentiates from the ordinary sense. But what is the oblique sense like? The matter is left obscure in Frege. Worse, the differentiation leads to 'an infinite number of entities of new and unfamiliar kinds' (Carnap MN, p.130; elaborated in Linsky 67, pp.44 ff). For the oblique sense is equated with a second-degree oblique reference, which is associated with a second-degree oblique sense, which ... (for details see Linsky, p.32 ff.). Furthermore, such a multiplication of entities is required, on Frege's theory, to account for sense and reference in sentences with multiple obliqueness caused by iteration of intensional functors[1] (as, e.g. in the sentence '$\sim N(J(\Diamond(Hs)))$', 'it is not necessary that John believes that it is possible that Scott is human' discussed by Carnap, MN, p.131). These multiplication problems, though a consequence of Frege's theory, are not however an objection to all Double Reference Theories. For alternative theories can be designed which equate ordinary and oblique senses. To these theories there are other objections.

In fact many of the objections made generalise to apply against all theories in the Fregean mode, that is to say all theories which

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[1] Even so, the multiplication does not account at all adequately for the logic of intensional discourse; see the discussion of the insensitivity problem below.

(i) distinguish two, or more, classes of sentence context, e.g. extensional-intensional, ordinary-oblique, customary-indirect;

(ii) claim that in the "non-ordinary" contexts subjects do not (really) have their usual references but different references, with the result that the subjects function as if they had been replaced by new subjects.[1] The result of the subject replacement of (ii) is that

(iii) predicate expressions in "non-ordinary" contexts have also to be understood differently, and so, to put it syntactically, predicates have also to be replaced, i.e. "non-ordinary" contexts are completely paraphrased. Thus in non-ordinary context f(a), not only is 'a' replaced by 'a*', but 'f' is also replaced by 'f*'. For it hardly suffices, for example, to replace 'Pegasus' in the sentence 'Pegasus does not exist' by the 'concept of Pegasus' or some set-theoretical construction (e.g. the ordered pair <Λ, m(p)> read, liberally; the null set in the guise, or mode of presentation, of Pegasus[2]), since, of course, the theories take their constructions, concepts or sets, to exist - otherwise what point the exercise has would vanish! So 'does not exist' has also to be paraphrased, e.g. in the easy case given to 'does not apply'. But mostly the paraphrases of intensional functors, especially in the case of set-theoretic constructions, have to go well beyond the resources of English.

With this much of the structure of these Multiple Reference theories (i.e. theories in the Fregean mode) exposed, the objections can be restated. They are:-

(1) The distinction problem, that is the problem of distinguishing ordinary, or extensional, sentence contexts from others. Making the distinction in a satisfactorily sharp way is a difficult matter, not or not merely because of borderline cases but because a solid non-circular basis for the distinction is hard to locate (as is explained in Slog, 7.13). In these empiricist times when distinctions are being demolished rather than forged, e.g. analytic-synthetic, descriptive-evaluative, when a certain holism is Wholesome, it is surprising that the extensional-intensional distinction, which causes similar problems to those of the synthetic-analytic distinction, has survived comparatively unscathed. In fact both sets of distinctions can be made out satisfactorily semantically, in a wider framework however than either empiricism or Fregean modes will admit (for main details of the distinctions, see Slog, UTM, and infra). The distinction problem is then a problem for theories in the Fregean mode, for essentially referential theories.

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[1] Thus Carnap's theory of extension and intension is not a theory in the Fregean mode, because 'every expression has always the same extension and the same intension, independent of context' (MN, p.133). Even so, Carnap's theory is open to several of the objections lodged against theories in the Fregean mode.

[2] A theory of this type has been advanced by H. Burdick (I am relying on an oral presentation of some of this theory). The basic idea is that in intensional contexts subject 'a' is replaced by an ordered pair <a, m(a)> with m(a) the mode of presentation (contextually supplied) of a in case a exists, and <Λ, m(ιx a-izes(x))> where a does not exist. The pair <a, m> is read - though without too much warrant - 'a qua m' or 'a in the guise of m' or 'a in mode m'. The modes, which like the new predicates do not seem to get much of the explanation their use requires - are represented by further predicates (or on a variant of the theory by properties). Such a particular theory is subject not only to the general objections, but also to objections specific to it, e.g. to the Burdick theory there are variants of Church's translation objection, and on the theory various implausible exportation principles emerge as logical truths.

(2) The iteration problem. Intensional functors (non-ordinary contexts) can be nested, one inside the other. Thus single replacement will not, in general, suffice; a whole procession of new subjects and new predicates to cope with iteration is needed (as Carnap has explained, in MN, in the case of the Fregean theory). The iteration problem can be somewhat alleviated - though not eliminated, as it reappears elsewhere, e.g. in issues as to replacement and as to what is meant by complex modes of presentation - by exploiting iterable set-theoretic constructions in place of Fregean concepts. For example, on the ordered pair theory, the claim that Augustus believes that he believes that he believes that Pegasus is winged, ordinarily symbolised $B_aB_aB_aW(p)$, can be represented in the fashion $B1^*_aB2^*_aB3^*_a \langle\Lambda, m(p)\rangle$ with the single uniform subject $\langle\Lambda, m(p)\rangle$. The penalty is that the theory cannot acknowledge the different replacement conditions in different intensional contexts, which Frege's theory does at least acknowledge even if it cannot take due account of them. Thus intensional logic, including modal logic, is entirely destroyed. Even such implications as that from $\Diamond(A \,\&\, B)$ to $\Diamond(B \,\&\, A)$, which should be automatic, are lost. But this is in part to anticipate the next objection,

(3) The insensitivity problem. The logical equivalences warranting replacement or interchange in intensional functors are different for different sorts of functors. For example, for modal functors (such as possibility, $\Diamond$) replacement of strict equivalents is legitimate, but such replacement is not legitimate in entailment functors or in functors of the order of belief (see RLR); and replacement of coentailing statements which is admissible in entailmental functors is not admissible in belief functors. Theories in the Fregean mode are insensitive to these important logical differences. For 'a' is replaced by 'a*' always in (connected) intensional functors and the replacement conditions for a* cannot vary depending on its sentence context, as a* is a referent subject to Leibnitzian conditions. Thus the equivalence conditions for concepts, for example, should be those of the most highly intensional functors (otherwise truth will not be preserved under replacement) with the result that legitimate replacements in less highly intensional functors are prohibited. The consequence is that theories in the Fregean mode are inadequate to the logic of the intensional.

(4) The compounding problem. Sentences with the same subjects, whose subjects are differently replaced in the theories, may be combined by sentential connectives, and operations applied to the subjects, e.g. some replaced by pronouns, quantification carried out, etc. For example, from the extensional-intensional compound

a is 60 but b thinks a is 50 (a)

transformations yield

a is 60 but b thinks he is 50, and

Of someone it is true that he is 60 but b thinks he is 50.

Such legitimate transformations theories in the Fregean mode are bound to prohibit. For (a) is replaced by

a is 60 but b (thinks 50)* a* (a*)

in which subject uniformity, required for the operations, is lost. Therewith too the relation of the parts expressed in

a is 60 but thought by b to be 50,

is sacrificed.

For similar reasons the theories of definition and analysis are thrown into confusion. What, for instance, is the reference of 'a' in $\nabla T(f(a)$, where contingent truth is defined $\nabla TA =_{Df} A \,\&\, \sim\Box A$? On analyses in the Fregean mode, 'a' must have both direct and oblique references (e.g. both a and <a, m(f)>). In the same way sentences like 'Scott happens to be human' and 'Babel erroneously believes that A' are, despite appearances, seriously ambiguous, with many terms having both direct and oblique references (cf. Carnap MN, p.132). It is evident too that disambiguating such sentences will lead to a rather unsatisfactory (and repulsive) atomism: with theories in the Fregean mode we are back on the royal road to ideal languages.

(5) *The explanation problem*. The new predicates (and sometimes subjects) introduced are, for the most part, only intelligible in terms of those they are intended to replace, and really have to be defined in terms of them if truth and other values are to be preserved. Yet for the theories to succeed quite independent - yet unforthcoming, and unsuppliable - explanations of the new predicates, explanations which are in no way parasitic on ordinary intensional discourse, are essential.

(6) Such theories are *unnecessary*. For the discourse they aim to replace, or analyse, is in order and intelligible as it is. It is only commitment to a mistaken, an essentially referential, view that has made it seem otherwise. Once the referential identity assumptions, incorporated in Leibnitz's law, are given up, the need to make replacements in referentially opaque contexts is removed; and once the Ontological Assumption is abandoned, the need to analyse negative existentials along concept lines is removed. As a matter of history, it appears to be commitment to Leibnitz identity (referentially justified at that) that forced Frege to his sense-reference theory in resolving intensional paradoxes. For consider how his argument (in Frege 52) breaks down without full replacement. Suppose, for a presumed reductio, identity is a relation between referents. Then, if a = b is true, 'a = b' should mean the same as 'a = a'. For, if a = b is true, then 'a' and 'b' are just two names for *one* and the *same* referent, and 'a = b' can tell us no more than 'a = a'. However this interpretation of identity statements must be false, because statements of the form 'a = b' are sometimes highly informative whereas 'a = a' is never such. The approach to identity replacement in the argument is, prima facie, inconsistent; for two inferences of the form: $a = b,\ D(a) \rightarrow D(b)$ are permitted, a first with *means the same* and a second, justifying the first, with *can tell us no more*, but a third with *is highly informative* is prohibited. However if the third fails so does the second, and the first; if 'a = b' is informative and 'a = a' is not then 'a = b' tells us more than 'a = a'. Thus too the fact that 'a = b' does not guarantee that 'a = b' tells us no more than 'a = a': Leibnitz replacement fails. Only the assumption that identity is a relation between *referents* restores Leibnitz - a restoration that lasts only so long as referents are not replaced by objects. For we can simply say that identity is a relation between objects *without* commitment to Leibnitz replacement, and accordingly *without* ensnarement in intensional paradoxes such as that of Frege's argument. Then a = b states an identity between objects a and b, and we can say, if we like, that 'a' and 'b' are both in fact about the one object a, i.e. b. But it is in no way permissible to proceed from this to: a = b says no more than a = a, or the like, without further, unwarranted, referential assumptions.

Double Reference theories such as Frege's are then essentially ways of trying to save Leibnitz's law (cf. Linsky 67, p.24). But the "law" does not need, or merit, saving. Yet without such assumptions of the Reference Theory theories in the Fregean mode are otiose.

(7) Such theories are inadequate to the data; they are open to counterexamples. Consider again the examples countering the Ontological Assumption, e.g. examples with intensionality incorporated in the subject, as 'The mountain RR is thinking about is golden'. Either the subject is replaced or it is not. If it is not, referential canons of the theories are violated, since the mountain in question does not exist (and without the referential canons the theories are unnecessary: see point (6)). But the subject can hardly be replaced, for the frame 'is golden' is extensional (and the null set, whatever its disguise, is not golden). Similarly other examples which counter theories of descriptions confound theories in the Fregean mode. Consider e.g. the statement that Meinong believed that the round square is round though nonexistent. Either the replacement object exists or it does not. If it does not then the theory is already noneist (in part) anyway and no such analysis is called for; while if it does then the analysis is inadequate, unless the predicate is also changed. Indeed the predicate will have to be replaced along with 'the round square', because Meinong did not hold corresponding beliefs of (the round square)* which exists. Yet what evidence is there that Meinong had an attitude, B* say, to (the round square)*? Precisely none - unless the whole thing is simply a translation into obscurese of what the theories were supposed to be analysing.

A special set of countercases arise from the treatment Fregean style theories accord to nonreferring descriptions, which are taken to refer to some sort of "null entity". Certainly improved Double Reference Theories avoid the obvious objections to the simplistic strategy of having all nonreferring subjects refer to the one entity, e.g. the null class, by (erroneously) having them each designate something different, e.g. 'a' designates $<\Lambda, m(a)>$ instead of Λ, so the designation of nonentity 'a' differs from the designation of nonentity 'b'. But, firstly, why say this? If the Reference Theory is abandoned, if sets do not exist, why not just say the obvious: 'a' designates a, as Meinong says? Why start replacing 'a' outside quotes by set-theoretical extravagances? Secondly, there are counterexamples to the improved treatments developing from counter-cases to the simplistic theory. One of the many places where these treatments run into trouble over the data concerns contingent (extensional) identities between nonentities, e.g. what I am thinking about = Pegasus. The statement is either contingently true or contingently false depending on what I am thinking about, but on Fregean theories it is necessarily true since the null entity necessarily equals the null entity. Were we permitted to make replacements on an ordered pair theory (e.g. on the grounds that the contingent identity is indirectly intensional because of one subject), the result would be even more curious. All contingent identities, whether true or not, with different predicates are rendered false because the null set in its different guises is never the same, i.e. $<\Lambda, m_1> \neq <\Lambda, m_2>$ where modes m_1 and m_2 are different because of different predicates. The null set is, in short, far from perfectly disguised on all occasions on this bizarre theory, which tries to replicate every nonentity by the null set disguised according to the description of the nonentity.

A not uncommon response is to dismiss such counterexamples as Don't Cares. This has the advantage, no doubt, of making the theories unfalsifiable: they work, like the Reference Theory, where they work. But too many of the places where they don't work matter philosophically.

Comprehensiveness of theory can however be obtained by going back on the basic distinction (of i)) between classes of sentences, such as extensional and intensional. Thereby also, by making the theory pure, several of the other objections to theories in the Fregean mode are avoided, indeed it is only in this way that they can be escaped. The resulting pure theory is not Fregean; for according to Frege 52, when 'words are used in their ordinary way, what we intend to speak of is their reference'. But according to pure theory - and this is only its first less than plausible feature - we always speak of concepts; syntactically replacement is made uniformly in all contexts including ordinary or extensional ones. Such a total replacement program is bound to succeed - in one sense. For all it offers is a homomorphic mapping, preserving truth values; e.g. where * is the mapping, $f(a_1,\ldots,a_n)$, translates to $f^*(a_1^*, \ldots, a_n^*)$, etc. But such a theory, though "pure", is rather trivial, and is largely uninformative: it has almost no explanatory power worth having.[1] Moreover what is the point of translating out referential uses, which are not (supposed to be) in question?

What is right about the Double Reference Theory is the realisation that something like a second factor is valuable in accounting for the logic of nonreferential contexts. Its mistake is to assume that because an explanation of the truth of such statements may involve appeal to a second factor, the statements themselves must refer to this factor. The Double Reference Theory, still in the grip of the Reference Theory, replaces the problematic subject by the concept associated with it, and then treats this new subject as occurring referentially. But what the replacement difficulties show is that statements where the second factor is relevant to truth are not generally statements about this second factor.

In contrast, in the alternative line of development of second factor theories, to sense and reference correspond respectively different (irreducible) ways in which one and the same subject term can be used, a referential way and nonreferential ways. To each way of occurring corresponds different identity and existence requirements - and, from one (but unfortunate) angle, different logics. Where a subject term occurs referentially what it is about must exist and it can be replaced by any term having the same reference; but where it occurs nonreferentially, it need have no reference, and can only in general be replaced by another term having the same sense. Thus the replacement difficulties which faced the Double Reference Theory are avoided (because there is no change of subject), while having distinct identity criteria and eliminating existence suppositions for nonreferential occurrence enables the alternative logical theory to cope with nonreferential discourse, which was the aim of the Double Reference Theory. For example, intensional and extensional properties do not become both referential properties of different items, but remain different sorts of properties of the same item. Thus intensional and extensional properties can be attributed to one and the same item without the relevant differences between the attributions being ignored. This is an essential preliminary to the adoption - as a special case of an adequate theory of intensionality - of the commonsense view of the objects of perception according to which it is the same item that both has ordinary properties like redness and roundness and may also have quite different perceptual properties such as being perceived to be red or round (i.e. Real Realism, as explained in chapter 8).

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[1] Less trivially, and differently, a Fregean universal semantics for languages may be supplied: but it is unnecessary when there are better and simpler non-Fregean semantics.

Many of the features of the alternative outlined are incorporated in Carnap's extension-intension method, but by no means all. For the replacement conditions for Carnap's intensions[1] are strict equivalence ones, but strict equivalents are not interchangeable in nonmodal intensional contexts, e.g. within the scope of perception functors, such as those of perceiving, seeing, smelling, etc. The second factor will have to differ then in its replacement conditions from Carnap's intension, the replacement conditions will have in fact to be like those for sameness of sense (and permit full replacement in nonquotational contexts).

The alternative second - or, more accurately, multiple - factor theory resembles a use theory; it is not a replacement theory like the Double Reference Theory, because the distinction turns not, as with sense and reference, on replacing problematic subjects by different subjects, but on how the same subject expression is used - referentially or nonreferentially. But don't these different uses really amount to assuming different subjects? Isn't the apparent sameness only obtained by using the same subject ambiguously, to cover both the entity and the concept? No, one and the same item can be used in different ways; for instance a knife can be used both as a cutting utensil and as a weapon. It doesn't follow that different knives are involved, nor would it be correct to conclude that a statement attributing both sorts of properties to a knife must be ambiguous. Similarly, as the knife model shows, it is wrong to conclude that because there are different uses of a subject there must be different subjects. The only reason for insisting that different uses do lead to different subjects and to different entities is the assumption that the only way of using an expression is somehow to refer; for then the difference in the way subject expressions can occur in intensional and extensional contexts can only be explained on the supposition that the subjects are different. But there is no difficulty in supposing that both sorts of properties can be combined in the one item once we have dropped the referential conception of an object and its properties.

According to the Double Reference Theories, nonreferential use is reducible, at bottom, to a kind of referential use. But according to the alternative theories nonreferential use is irreducible, that is sentences containing nonreferential occurrences are not generally replaceable by sentences containing only referential occurrences, preserving truth-values. Hence the replacement difficulties encountered by Double Reference Theories are avoided.[2]

The distinctive feature of the alternative noneist theory is that one and the same expression may have both referential and nonreferential uses, although any one use will of course be either referential or nonreferential. Analogously one and the same item can have both referential and nonreferential properties, for example it may have empirical properties like being round and red and also intensional properties. So it is commonly in natural language. For example, the table can both be round and believed to be round. It is the same thing that is said to have both properties, and it is clearly quite wrong to say that the word 'table' is used ambiguously in the sentence 'The table is round and it is believed by Bill to be so', as various offshoots of the Reference Theory would have us say. What is correct is that the term 'table' can function differently in different sentence contexts; for example, that different identity criteria apply for different occurrences.

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[1] References but for the fact that modal identity conditions prevail.

[2] Similarly, nonreferential use cannot be eliminated in favour of talk about use, as referential but referring to sets of rules or the like.

Since nonreferential occurrence is primary, the likely direction of reduction is precisely the reverse, of referential discourse to nonreferential: the contextual constraints on this have however already been observed.

But now the factors, which are too easily converted under referential pressures into further references - as happens with Carnap's theory in MN and with C.I. Lewis's theory - can be transcended, they can be stepped over and beyond. The second factor and further theoretical factors, sense, intension, comprehension, can be removed from the initial uniform picture of the logical behaviour of discourse that thereupon begins to emerge (these factors can, of course, be subsequently recovered definitionally, insofar as they are needed). Use of use, although an invaluable staging point in getting beyond the field of referential forces, is hardly satisfactory as a final stopping point.[1] For the end resulc, a use theory of meaning and truth - with use superseding the factors - is open to quite damaging objections[2], unless the sort of 'use' is more carefully circumsribed. But circumscribed it may be (in a theory of objects fashion) by restricting use to interpretative use, by taking use as a specific function, an interpretation. In the universal semantical theory for discourse[3] the application of the interpretation function I to a linguistic expression is always a function, a function which yields, at a given world and in a given context, an object, not a reference (for the object may be a nonentity, e.g. an individual or a function). In terms of this interpretation function, which gives the rule, or use, of every part of discourse, both truth and meaning can be defined (see UTM). Furthermore, a significant synthesis of theories of meaning can be achieved. First and foremost the theory is a use theory; for the meaning, or interpretation of an expression is a function and thus, in a precise way, a rule for the application of the expression in every situation and context. Secondly, the theory is, in a wide sense, a denotational-type theory, it provides by a general recipe an object as the meaning of each linguistic expression.[4] Thirdly, reference and sense, extension and intension, can be defined in terms of the theory, and the limits of their applicability established (cf.UTM). In a similar way other theories of meaning can be embraced, e.g. content accounts, contextual implication accounts, and so on.

What is basic in this approach (which only appears high-flying because not enough earthly detail has been given) is the explication of use by interpretation in semantical modellings, with interpretation conceived in noneist terms and not referentially restricted. This points the direction which the semantical elaboration of nonclassical logic can satisfactorily take. The use account also shows the way revision of logical theory should proceed.

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[1] On both these points see Wittgenstein, especially 53.

[2] For some objections, see Findlay 61. But really many objections are quite conspicuous, e.g. the range of irrelevant uses linguistic expressions have, the problem in explaining how truth is explained through use, etc.

[3] Adumbrated in part IV. For full details see UTS and UTM.

[4] As to how this theory, which can be a part of noneism, differs from, but relates to, the RT, see SMM, p.197.

Nonreferential use is a fact of ordinary discourse, a fact not adequately recognised in mainstream logics. In order to allow for nonreferential occurrences in logic an essential preliminary is the abandonment of those assumptions embodied in classical logic which stem from the Reference Theory, that is, those assumptions which force us to say that there is only one way a subject expression can properly occur, a referential way. These assumptions include the Ontological Assumption, the Indiscernibility of Identicals Assumption, and derivative assumptions such as the assumption that everything exists. The dropping of these assumptions is however entirely preliminary to what is important and really required, the admission of nonreferential occurrence. To drop the basic and derivative assumptions of the Reference Theory is to leave open the possibility that the subject of a true statement may occur other than referentially. Though a necessary first step, this is a long way from implying that there are nonreferentially occurring subjects in true statements, and very far from providing any of the requisite features of their logical behaviour.

Two integrated stages lie ahead then: a stage of demolition of classical logical theory and its variations and elaborations, and emerging from this, a stage of renovation and rebuilding, of designating and constructing new logics and semantics which can account for nonreferential discourse.

III. The need for revision of classical logic.

It is a corollary of the rejection of the Reference Theory that classical logic is seriously wrong, and, since a logic is still needed, in need of drastic revision. Briefly, since classical logic embodies the Reference Theory and the Reference Theory is false, classical logic is wrong. The same theses, of inadequacy and of the need for revision, can be argued for in a rather more independent fashion.

No part of classical (two-valued) logical theory escapes serious criticism under the theory of items eventually arrived at. Table one separates some parts of classical logical theory, and indicates the sorts of criticism made. Some of the criticism summarised in the table, especially that of quantification logic and of identity and description theory, is an integral part of the case for alternative logics in harmony with a theory of items, and accordingly merits more detailed presentation. In more ambitious undertakings - something the development of alternative nonclassical logics certainly warrants - all these criticisms and others would get elaboration. Many of the criticisms can of course already be found in the literature: the overwhelming case for alternative logics is in large measure a matter of organising the scattered criticism into a coherent whole.[1]

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[1] The main criticisms I want to lodge, which are not included in the text, may be tracked down in the following sources:- sentential logic, detailed critique of classical logic and of irrelevant alternatives, RLR; quantificational logic, SE, EI, SL; identity theory, EI, SL; class and relation theory, and number theory UL, SL, WN; metalinguistic theory, P, DLSM.

Table One

Part of Classical Logic [Place in PM where developed]		Sorts of Criticism Made
Sentential (or propositional) logic [*1 - *5]	(1)	The rule γ of Material Detachment is not generally correct.
	(2)	The logic fails to include essential connectives, such as satisfactory implicational and conditional connectives.
Quantificational logic [*9 - *11]	(1)	The logic includes material assumptions such as that some things exist.
	(2)	The logic does not include other than existentially-restricted quantifiers and subject terms, and accordingly fails to allow for the formalisation of much important discourse which is not, or not obviously, existentially committed.
Identity theory [*13]		Either the theory fails (as in PM2) entirely for intensional discourse, or (as in PM1) the theory includes no account of ordinary, extensional identity.
Description theory [*14]	(1)	There are clear counterexamples to the theory.
	(2)	The theory is incompatible with leading and independently defensible theses of the theory of objects.
Class and relation theory [*20 ff.]	(1)	The treatment of paradoxical items, and the resolutions of the paradoxes, are inadequate.
	(2)	There is really no theory of properties or intensional relations.
	(3)	Many unwarranted assumptions as to the existence of classes and relations are made.
Number theory [*50 ff.]	(1)	The reductions assign numbers many properties they do not have.
	(2)	Platonism is incorporated and rendered a matter of logic.
Metalinguistic theory [post PM]	(1)	The (referential) case for the theory does not bear thorough investigation.
	(2)	The theory does not offer a satisfactory resolution of semantical paradoxes.
	(3)	The theory would eliminate (and hence supply no logic for) much important discourse.

§8. *The inadequacy of classical quantification logic, and of free logic alternatives.* At least an existence-free reformulation of quantificational logic is needed if logic is to be, as it should be both nonplatonistic and independent of non-logical studies such as physics. For, according to classical logic, there exists an item which is either f or is not f; so there exists an item. But without either some version of platonism of physics no existent item is guaranteed. Both the thesis that logic presupposes some platonistic metaphysics and the thesis that logic presupposes certain contingent truths of physics are, however, open to telling objections. For example, central truths of logic should be prior to and independent of those of particular metaphysical theories; for, as they are applied in deducing consequences from and thereby assessing these theories, they should not depend for their correctness on these very theories. Again, the truths of pure logic are necessary truths, uncontaminated by contingency; hence they cannot - without commission of a modal fallacy - imply contingent truths or settle between various consistent physical theories. Logic should not depend on the state or permanence of the universe, or on the correctness of, say, Einstein-Minkowski space-time theory to ensure purely past and purely future individuals and events as values of individual variables; nor should it rest upon or arbitrate in favour of a platonic metaphysics. Thus some reformulation of logic, in which classical existence theorems such as $(\exists x)(xf \vee \sim xf)$ and $(\exists f)(\exists x)xf$ are eliminated, is essential.

This first trouble with classical quantificational logic, that it improperly involves nonlogical material assumptions. can be classically solved - if so inelegantly that the methods are rarely adopted in classical textbooks - by one or other of logics with empty domain. This does not go to the root of the trouble. The switch to a classical logic which allows for an empty domain does not permit theories - for instance, virtually any mathematical theory - to be restated nonplatonistically, without a heavy loading of existential claims. For the switch does not enable anything much to be said about what does not exist.

The first trouble is symptomatic of larger, and serious, limitations of classical quantification logic, namely

L1) the inability of the logic to express subject-predicate assertions, and truths, where the subject item does not exist, and

L2) the limitation of quantifiers admitted to existentially-loaded ones, and the consequent inability of the logic to formalise quantificational claims about what does not exist.

Because of the limitations much important discourse, and some major philosophical theories, lie beyond the scope of classical expression. Also because of the limitations many philosophical problems are generated, (pseudo-) problems which vanish upon liberalising the logical framework. Overcoming the second limitation presupposes that the first limitation has been overcome; otherwise wider quantifiers have nothing to range over.

There are accordingly two main ways of reforming classical quantification theory, by (existence) free logics which remove limitation L1) but not L2), and, more radically, by (ontologically) neutral logics which eliminate both L1) and L2). To elaborate the differences:- In free logics[1] classical

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[1] Splendidly promoted by K. Lambert, and his collaborators and students: see e.g., Lambert-van Fraassen 72 and references cited therein, p.178, p.200 ff.

(footnote continued on next page)

ranges of bound variables are, in effect, taken over unchanged; thus individual bound variables have as designation-ranges just (individual) entities. In neutral logics on the other hand, ranges of bound variables are widened like those of free variables to admit at least some sort of nonentities as objectual values, and appropriately wider quantifiers are therefore introduced. The distinction free logics are obliged to make between free variables and bound variables is artificial, and also unwarranted, since we can and do talk perfectly well quantificationally about nonexistent objects. Certainly in free logics presuppositions of classical logic, such as that something necessarily exists, are eliminated; only in neutral logics, however, can one explicitly deny that something does not exist and talk freely, generally and particularly, about the wide variety of objects that do not exist. And really the whole dependence, in free logic as in classical logic, of how logic goes on or whether objects exist is deeply wrong: logical inference and implication are substantially independent of whether the objects they are about exist.

Free logic changes both the formalism and (therefore) the interpretation of classical quantification logic. Neutral logic changes the interpretation of quantification and accordingly can retain its formalism; but it augments the formalism in such a way as to include the correct insights and criticisms of free logic. The basic scheme of classical theory, on which derivation of the mistaken existential principles of the theory typically rely, and which both free and neutral logics fault, is the scheme of existential generalisation

(EG) $af \supset (\exists x)xf$,

already criticised.[1] EG, a direct outcome of the Ontological Assumption, is open to a variety of prima facie counterexamples, such as these: Meinong's round square is believed by noneists to be round and square, but it is false that there exists an item which noneists believe to be round and square; phlogiston does not exist but it is impossible that there exists an item that does not exist; Cerberus is a three headed dog but there does not exist a three headed dog; the philosopher Aristotle is dead but it is false (we claim) that there exists a philosopher who is dead.[2] Classically the formalism is saved by restricting the interpretation of the symbolism: subject terms are required to be existentially-loaded, and typically - to save identity and existence requirements of the Reference Theory - predicates are also restricted to cut out intensional predicates and ontic-status predicates like 'does not exist' and 'is dead'. But the saving saves too much, and supposes once again, what is false, that something must exist. And why make the 'saving'? Surely we want also to be able to logically enshrine some of our reasoning about nonentities.

(footnote [1] continued from previous page)
Lambert sometimes characterises 'free logics' in a much more sweeping way which includes neutral logic as a free logic. But in 72 (p.129) Lambert and van Fraassen count as 'free logics' logics 'that deal with singular terms in the way we do', i.e. without nonexistential quantifiers.

[1] Equivalents such as universal (existential) instantiation

(∀I) $(\forall x)A \supset \check{S}^{x}_{a}A|$

are faulted at the same time.

[2] Similarly for many many other examples, e.g. the examples considered (though with the connected inference pattern $af \rightarrow (\exists x)(x = a)$ in view) in Lambert-van Fraassen 72, p.130: Zeus is not identical with Allah; The ancient Greeks worshipped Zeus; The accident was prevented; The predicted storm did not occur; True believers worship Beelzebub.

1.8 FREE LOGIC IS AN INSUFFICIENTLY RADICAL REFORM

It is better by far then to amend the formalism to *show* the correct logical principles than to smuggle the proper restrictions into the interpretation. The correct replacement for EG is, as emphasized in the case for free logic, the scheme

(FEG) $af \,\&\, aE \supset.\; (\exists x)xf$

where 'aE' reads 'a exists'. For consider the counterexamples to EG: what is lacking in each case (which the Ontological Assumption is supposed to supply) is the assumption that a exists, and the fault is rectified by adding aE to the antecedent. It is the amendment of EG to FEG that is characteristic (but not definitive) of free quantification logic as developed by Lambert, and others; and in this way (existence) free logic avoids the existence assumptions of classical logic. Plainly free logic adds to classical logic[1] a predicate 'E' taken at the pure quantification stage as primitive (given identity, E may be defined: $aE =_{Df} (\exists x)(x = a))$. The remaining very distinctive thesis[2] of free logic, $(\forall x)xE$ (i.e. $\sim(\exists x)\sim xE$), every entity exists (i.e. no entity does not exist), fixes the intended interpretation of 'E', as a universal predicate.

The reform of classical quantification logic thus accomplished by free logic, though important, is insufficiently radical. Worst, in free logics classical ranges of bound variables are taken over intact; it is because bound variables have as ranges just entities that the free logic thesis $(\forall x)xE$, read: Everything exists, and redolent of arch-referentialists such as Quine, is valid. Thus too free logics retain such notable consequences of the Reference Theory as that to exist is to be the value of a bound variable: the excape of free logics from the Reference Theory is only partial.

But if the ranges of constants and free variables can be widened to admit nonentities, why cannot the ranges of bound variables be similarly enlarged? Of course they can, and in the obvious, and (can we say) natural,[3] semantics for free quantification logic they are so enlarged. A *natural model* for free logic has, as well as the usual interpretation function I, two domains, an inner domain ID over which bound variables range, and an outer domain OD, which includes ID, over which free variables range. The interpretation I(a) of constant a is some element of OD, and the interpretation of n-place predicate f^n, $I(f^n)$, is an n-place relation on OD. Apart from the aforementioned features a model is defined as for classical quantification logic. In the absolute model (reflecting the true state of affairs) ID is the domain of entities and OD of objects. Now the ordinary explanation of central semantical notions, such as validity, requires quantification over the outer domains, i.e. absolute quantification over all objects; for example the definition of validity in a model begins: whatever elements of OD are assigned to constants, ... But if quantification over the outer domain is permissible in the semantical metalanguage of free logic, then it ought - if the logic contains adequate means of expression and is honest - to be permissible in the object language also. Various replies can be made to such objections, the most telling of which is that a semantics for free logic can be provided which makes use only of inner domains, and more generally that a semantics for free logic can be given which makes use essentially only of free logic (type of) resources. That such semantics can be given (and in more than one way) is true. The motivation usually given for such rather more contrived semantics and for the restriction of free logic quantifiers indicates however that free logic is intended to operate within the assumptions of the Reference Theory and really offers no adequate escape from them. With only an inner domain in the referential model $\underset{\sim}{M}$.

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[1] As well as an essential distinction between constants and free variables on the one side and bound variables on the other, else it collapses back into classical theory upon defining xE in terms of any tautology, e.g. as t.

[2] Free quantification logic differs from classical quantification logic, as formulated e.g. by Church 56, only (after rewriting in reverse notation) in adding the primitive E, subject to the axiom $(\forall x)xE$ and in replacing scheme $(\forall I)$ by

(FAI) $(\forall x)A \supset.\; aE \supset \breve{S}^{x}_{a}A|$

the equivalent of replacing EG by FEG. Hence FEG (or FAI) and $(\forall x)xE$ are, so to say, the distinctive theses of free logic.

[3] Cf. Lambert-van Fraassen 72, p.200:

> To be sure some could develop a philosophical semantics for free logic that does recognise a realm of non-actual but possible beings. This, indeed, is the most natural (though not the only) way to interpret the "outer domain" semantics ... .

'Other ways' which can include an analogue of an outer domain are substitutional and truth valued semantics.

> not all constants need have a designation in the domain; some may be nonreferring terms. How can we find out whether "Pegasus flies" is true in $\underset{\sim}{M}$ if "Pegasus" does not designate anything in $\underset{\sim}{M}$? The answer to this question is: we can not find out. Since Pegasus does not exist, there are no facts to be discovered about him (Lambert-van Fraassen 72, p.180).

Similarly on the modelling Pegasus, in contrast to entities, has no properties and stands in no relations: the Ontological Assumption is bought, in almost unvarnished form. However (by artificially separating the truth of af from a's having the property of f-ness) sentences like 'Pegasus flies' can be arbitrarily assigned by the model one of the truth values, true or false.

> What we can do is arbitrarily assign that sentence a value. Or we can say that due to its occurrence in some story ... the *name* "Pegasus" has acquired a certain connotation. Due to this connotation, we may feel "Pegasus swims" is false and "Pegasus flies", true. To get all the true sentences in the language, then, we need as part of a model $\underset{\sim}{M}$ also a *story*. This story has to be consistent with the facts in $\underset{\sim}{M}$, of course (72, p.180).

Then where some a_i does not refer (to an entity), $(a_1 \ldots a_i \ldots a_n)f^n$ is true in $\underset{\sim}{M}$ - it is not a *fact* in $\underset{\sim}{M}$ - iff it belongs to the story $\underset{\sim}{S}$ of $\underset{\sim}{M}$. The main reason for not varying this compromise modelling - so that facts are determined by the story also, e.g. the fact "Lambert pioneered free logic" is true in $\underset{\sim}{M}$ because it is part of the (logical) story $\underset{\sim}{S}$, or, on the other hand, so that the story is determined by the facts about nonentities - is just to avoid a theory of objects, to retain a sharp division between entities and ..., to maintain "a robust sense of reality" (p.72, 200):

> In our development (of the semantics), *talk* about non-existent objects is just that - "talk" is what is stressed. "Non-existent" object, for us, is just a picturesque way of speaking devoid of any ontological commitment.

The truths concerning nonentities are just talk, parts of stories: there are no facts about nonentities. This, like the idea that if there were more than talk, facts, there would be ontological commitment to nonexistent objects, is a hangover from the Reference Theory. "Free logic", so interpreted, is not a liberated position congenial to the theses of the theory of items, but essentially an opposition position, a cooptive extension of classical logic designed to remove, in a different way from classical theories of descriptions, certain of the more conspicuous prima facie objections to the Reference Theory.

Even when more satisfactorily construed, with an outer domain of objects, free logic is no panacea. Very many of the problems classical logic generates transfer intact to free logic. Thus, for example, all the classical difficulties concerning quantification into intensional contexts are equally problems for free logics. Like classical theory too, free logic cannot accommodate mathematics as an existence-free discipline (indeed existence theses appear in a very conspicuous form on the "free" account), and it cannot account, without implausible platonism or implausible reductions, for the ideal nonentities of theoretical science.

Neutral logic, by contrast, avoids these problems. Moreover neutral logics are richer than free logics and properly include them.[1] Neutral logics are much preferable to free logics not just because they are less poverty-stricken in their means of expression, and more comprehensive in theses, but also because they are much better equipped to accomplish the objectives already argued for in previous sections. For instance, free logics soon prove inadequate as foundations for intensional and chronological logics, because they prevent the formalisation and assessment of frequently-made claims about nonentities.[2] Indeed they are inadequate for the symbolisation of many sentences of natural language, e.g. sentences like the examples displayed towards the end of part I. An adequate quantificational logic, which does enable proper formalisation of discourse and which removes classically generated problems, requires removal of limitation L2) as well as L1). Insofar as free logic makes one liberalisation but not the other it is an unsatisfactory halfway house on the way to an adequate theory. It is a halfway house, moreover, that is scarcely likely to make the transition to a fully liberated logic easier. For the motivation of free logic remains at fault: the idea that we can only talk quantificationally about what exists is an outcome of the Ontological Assumption. Yet if the Ontological Assumption should be rejected, when formulated with arbitrary constants, then it should be rejected generally, when formulated with variables or quantificationally.

§9. *The choice of a neutral quantification logic, and its objectual interpretation.* Bringing the ranges of bound variables into line with those of free variables means introducing new quantifiers, quantifiers which are not existentially controlled as '∀' and '∃' are.

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[1] For details see DS, and also SE.

[2] It can be confidently predicted too that the projects of modalising and intensionalising free logics, and combining the results with a satisfactory theory of descriptions, will encounter serious difficulties. And the evidence thus far is that they do (for the same reasons as in the classical case: see part IV).

1.8 POSSIBILIA LOGICS DO NOT GO FAR ENOUGH

A tempting move has been to extend the derived ranges of both free and bound variables to include possibilia, and to introduce corresponding quantifiers 'Π', read 'for every possible', and 'Σ', read 'for some possible' (see, e.g. SE). The new scheme of generalisation - of possibilia logic -

(◊G) $\quad af \supset (\Sigma x)xf$

enables many of the worst objections to EG to be escaped. Moreover free logic can be recovered as a special case on introducing the predicate 'E' since

$$\begin{aligned} af \,\&\, aE &\supset (\Sigma x)(xf \,\&\, xE) \\ &\supset (\exists x)xf \end{aligned}$$

and since $(\forall x)xE$ reduced to the theorem $(\Pi x)(xE \supset xE)$ upon defining $\forall$ in terms of Π and E, or equivalently in terms of $\exists$ and $\sim$. Possibilia logics are more liberal than free logics; for example, though free logic enables one to assert that Pegasus does not exist it does not enable one to infer therefrom that something does not exist. Possibilia logics are decidably preferable to free logics for the reasons already given: namely, they are much less impoverished in their means of expression, more comprehensive in theses, and much better equipped to accomplish the objectives earlier outlined.

Despite their advantages possibilia logics do not go far enough; they reintroduce practically all the problems of classical logic concerning existence, only as problems concerning possibility. Thus the new scheme ◊G, though it escapes many counterexamples that vex EG, still faces a similar class of objections, represented by the following counterexamples: Meinong's round square (Mrs) is round and square but it is false that some possibilia is round and square; also it, Mrs, is impossible but no possible item is impossible; and Meinong believed his squound was squound but it is not true that for some possibilium Meinong believed that it was squound. Rather similarly the scheme can be corrected by a free logic strategy. In free possibilia logic ◊G is replaced by the properly qualified scheme,

(F◊G) $\quad af \,\&\, a \;\rightarrow (\Sigma x)xf,$

where '◊' reads 'is possible'. ◊F can of course be "saved" by restricting ranges of variables to possibilia; F◊G goes beyond this and liberalises the ranges of free variables but not of bound variables, so that impossibilia can be values of free but not of bound variables. This unhappy discrepancy between the roles of free and bound variables and, more generally, the anomalies of possibilia and free possibilia logics can be avoided by introducing wide neutral quantifiers which place no restrictions on the class of items introduced. Then the scheme - of neutral quantification logic -

(PG) $\quad af \rightarrow (Px)xf,$

where 'P' reads 'for some (whether possible or impossible)', is correct without interpretational qualification.[1] No qualification of the antecedent is needed to avoid falsification of the implication or to permit detachment, thereby eliminating the problems that arose in the case of classical logic and to a lesser extent with possibilia logics, that, to put it another way, there is a class of items subjects may be about lying outside the scope of the logic.

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[1] At once there is an, inessential, qualification to exclude absurdia in the main development that follows. As to how nonsignificant subjects may be included as well in the formal theory see Slog, chapter 7, where a beginning is also made on the vexed question as to whether such subjects are about objects.

There is indeed (as will become plain when objections are met) nothing to prevent a neutral reinterpretation of quantification logic. For the formalism of classical quantification logic on its own carries no commitment to the actual; it is the usual semantics and interpretations together with associated theories - descriptions and identity especially - that account for the referential character of the standard logic. The valid schemata of classical (referential) quantification logic continue to hold for neutral quantification logic when rewritten with 'P' uniformly replacing '∃' and 'U' uniformly replacing '∀'. To this extent neutral quantification logic, as so far introduced, merely provides a reinterpretation of quantification logic - with the schemata rewritten to stress the new interpretation and to enable the derivation of the logical behaviour of the (original) referential quantifiers '∃' and '∀'.

The intended interpretation of the neutral quantifiers is an objectual one, in the sense of 'object' of the theory of objects. Specifically the semantical evaluation rules for the quantifiers take the following objectual form, relative to a given domain of objects:

> For a given assignment of objects to the free variables of wff A, the value of (Ux)A is 1 iff the value of A is 1 for every assignment of objects to x, and the value of (Px)A is 1 iff the value of A is 1 for some assignment of objects to x (cf. Church 56, p.175).

More concretely, (x)xf is free iff f is true of some object a in the range of subject variable x. In terms of the theory of objects such an objectual interpretation is a very material one, and it enables a number of fiddling objections to options to objectual interpretations of quantifiers, such as substitutional interpretations, to be simply evaded; for example, objections such as that there may not be enough names to match the range of objects, or that names are countable in number and objects not. It is sometimes assumed that a quantificational logic which admits talk of nonentities has to invoke a substitutional interpretation of quantifiers, i.e.

> The value of (Ux)A is 1 iff the value of A(t/x) is 1 for every term t, and of (Px)A is 1 iff the value of A(t/x) is 1 for some term t.

Such an assumption is made, for example, in Lambert-van Fraassen (72, p.217):

> Some things are impossible ... Name one. The round square .... It's totally impossible. [It is assumed] that a statement of the form 'Somethings are ...' is true if some statement of the forms "...is a..." is true. This has sometimes been expressed as: whatever can be a subject of discourse has being. Today we refer to it as the substitutional interpretation of quantifier phrases.

But the initial dialogue is perfectly compatible with an objectual interpretation, and in no way depends on a substitutional construal. Nor need it involve at all the thoroughly mistaken thesis that whatever can be the subject of discourse has being ("is a" does not entail "is" without an Ontological Assumption added in).

While many of the objections to substitutional interpretations, formerly thought to destroy them except for limited purposes, certainly do not succeed (even the insufficiency of terms objection fails given, as the theory of objects permits uncountably many names), and while substitutional interpretations are often heuristically very useful, there are reasons for avoiding substitutional interpretations[1] and the like, e.g. truth-valued semantics and domainless semantics, at least to begin with (they can be recovered later, as DS and SL indicate). Firstly, substitutional semantics are nominalistically inspired - they represent but another attempt to replace objects by names for them - and they are quite unnecessary once the Reference Theory is rejected. Secondly, in one respect, they allow too much; for they enable quantification to take in parts of speech that are not subjects, e.g. even parentheses as placeholders for quantifiers. This is illegitimate for the same reasons that second order quantification of predicates is (see SL, chapter 7). But thirdly, they offer insufficient analysis; for they fail to get inside structured sentences and offer analyses of their parts. For this reason they become rather contrived - if applicable at all - where internal sentence structure really matters, e.g. in theories of identity, descriptions, adverbial modifiers. For like reasons they do not enable a theory of meaning to be straightforwardly obtained from a theory of truth, since many parts of speech are not assigned an interpretation. Not even descriptions for subject terms are readily forthcoming; and if they were substitutional interpretations would again be otiose.

Though the truly objectual reinterpretation of quantification logic escapes these difficulties and has other advantages, it has some important side effects often thought damaging. In particular, the reference and individuation requirements commonly imposed on items in order to apply referential quantification logic can no longer be properly applied. There is, however, nothing to stop quantification over items that are not appropriately individuated and existent (i.e. not entities subject to referential identity) or over items that are not appropriately clear and distinct. Suppose the drunken Greasely seems to see a freckled duck, though the duck may not exist and may be indeterminate as to the number of freckles and to that extent not completely individuated; nevertheless PG holds, and it follows that for some x the drunken Greasely seems to see x, though it does not follow and is not true that there exists a (properly individuated or clear and distinct) x such that the drunken Greasely sees x. Quantification requires then none of the conventionally assumed necessary conditions, existence, distinctness, countability (as indeed reflection on the natural language uses of 'every', 'some', 'many', etc., should have revealed long ago). Nor (contrary to the implicit assumptions of seventeenth century rationalists and of Kantians) must quantification be restricted to the possible.

For why stop short at possibility? There are many cases, especially in mathematics and intensional logic, where we need to talk, reason and argue about impossibilia just as much as possibilia. Many of the arguments and reasons for going on from existential logic to possibility logic prove just as effective as arguments for not stopping at possibility. For example, impossibilia just as much as possibilia may be the objects of intensional attitudes and properties, e.g. one may have beliefs and opinions about and an interest in the round square just as one may in the perfect blue square. Hence since the logic of intensional discourse must take account of such functors it must admit impossibilia along with possibilia. Likewise, impossibilia may be the objects of logical argument, as when one argues that "Necessarily the round square does not exist, so necessarily something does not exist". Impossibilia, and quantifiers ranging over them, are essential if such arguments are to be faithfully reflectable in logic. The impossible situations called for in the semantical analysis of intensional logic and of entailment provide (as RLR explains) excellent working examples. For impossible situations - which are quantified over in the semantics - are but one sort of impossibilia. And so on, through variations on the prima facie reasons already presented for the Independence Thesis.

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[1] The usual substitutional interpretation has other drawbacks as well, e.g. it makes analytic, what is false, that everything has a name.

There are, to sum up, excellent reasons for proceeding to wide quantification, that is for logical change, so as to include within the scope of logic, reasoning about both possibilia and impossibilia. Though the uninterpreted formalism of quantification theory is satisfactory, the usual interpretations of quantification theory are not: this applies both to referential interpretations of the theory in terms of ranges of entities, and also to more recent liberalisations of the semantics which admit possibilia as designation-values of variables. But once the semantics is changed to admit talk of possibilia and impossibilia, quantification theory needs, it soon appears, supplementation, enrichment by further notation so that recognised features of nonentities such as indeterminacy and inconsistency can be dealt with logically.

§10. *The consistency of neutral logic and the inconsistency objection to impossibilia, the extension of neutral logic by predicate negation and the resolution of apparent inconsistency, and the incompleteness objection to nonentities and partial indeterminacy.* A common reason for stopping at possibilia is the belief that we cannot talk consistently about impossibilities, hence they are "illogical".[1] But the belief is mistaken: semantical modell-

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[1] This is a belief I was briefly persuaded to share. The original script of SE was drafted in terms of neutral quantifiers which included in their range impossible objects, but subsequently the paper was rewritten with possibility-restricted quantifiers, for the reasons set out in SE, pp.259-60. But the argument there outlined does not establish its point - without the importing of further assumptions (implicitly adopted) concerning the properties of impossibilia, properties supplied by (tacit but illicit) use of the Characterisation Postulate.

The argument of SE, p.259, proceeds from consideration of Primecharlie, the first even prime greater than two, to the conclusion that, for some f, Primecharlie f and ~Primecharlie f, violates the syntactical principle of noncontradiction of quantification logic. But the argument depends on the assumption that "Primecharlie is prime" and "Primecharlie is not prime" are either both true or else both false; and it may be broken at this point. For without further assumptions, e.g. from a theory of descriptions or from the CP, there is nothing to settle these truth values, and nothing to prevent the taking of one as true and the other (accordingly) as false. Such assignments we shall accept, realising full well that we may be storing up trouble for the future, at the post-quantificational level. The reason is this:- A naive use of the CP would lead to the conclusions that Primecharlie is prime and that Primecharlie is an even number greater than two. But by neutral

(footnote continued on next page)

(footnote continued from previous page; text continues on page 85)

arithmetic (e.g. first-order Peano arithmetic, written with neutral quantifiers), for no even number n greater than two is n prime. Hence Primecharlie is not prime. There are, however, several options to investigate before the area is declared a disaster area unfit for logical habitation, and only one of these, the first, involves abandoning neutral quantification logic: (1) Neutral arithmetic is reformulated non-classically with a paraconsistent quantificational base. In chapter 5 we shall say that this sort of move is on its own not far-reaching enough. (2) A suitable sentence negation-predicate negation distinction is made. The basic line of argument is given in this section. (3) The CP is restricted, e.g. so that it does not tell us that Primecharlie is greater than natural number two. This approach is followed through in chapter 5 and subsequent chapters. In the end something from each option will be adopted.

Arguments that substitutional quantification cannot be extended - at least while a classical logic base is retained - to include all non-referring terms fail for similar reasons; that additional, rejectable, assumptions have to be made for the argument to succeed. Consider, for example, Woods' argument (77, pp.665-66) that Haack's substitutional approach to the logic of nonexistence 'does not work'. The argument supposes, first, that for the term 'Atherton' the statement that Atherton squared the circle, a cl for short, is true. Woods appeals to a fictional source for the truth (Atherton squared the circle in an obscure novel by Djaitch du Bloo), but the CP would serve as well or better (with Atherton as the man who squared the circle). Given a cl Woods' argument is brief:

> "Someone squared the circle" is not embarrassing because "Atherton squared the circle" is true. Existence may not be imputed, but self-contradiction is. And from a contradiction anything follows. If you are a classicist, that is (77, p.666).

Further assumptions are required, however, to show that self-contradiction is imputed. For if it were (by an S2 modal scheme distributing possibility), ~◊(a cl). But a cl is given as true so ◊(a cl) again by S2 principles, and so classically it is not the case that ~◊(a cl). In short, on the classical scheme of things with such substitutional quantification superimposed, self-contradiction is not - cannot be - imputed. The further story, given a cl, would perhaps be that a is an impossibilium, since it is certainly not possible that there exists, or even is possible, a person who does what Atherton does. Impossible objects can however perform impossible tasks. Such a claim makes it plain that once again there is further logical ado: the logic of entities cannot be transferred intact to the logic of nonentities, even if bits of it like quantificational logic (and perhaps the logic of identity and relations) can:- For referentially "Someone squared the circle" would be taken to imply "The circle can be squared", which contradicts the textbook thesis that the circle cannot be squared. With nonreferential discourse some at least of the referential links have to be broken. Which - a matter we come to - is however a task beyond the quantificational stage (though it can reflect back on the quantificational logic).

ings (e.g. of relevant logics) show that we can talk consistently about what is impossible. In fact it already follows from the consistency of reinterpreted quantification logic that we can talk consistently in limited ways about impossibilia, just as it follows that we can talk consistently about possibilia - once we abandon the Ontological Assumption so that we are not troubled by such elementary arguments as that in speaking of what does not exist we are contradicting ourselves by saying that there exist things that do not exist. This refutes - it should be for once and all - the widespread idea that any theory of impossibilia is bound to be inconsistent; it is evident from neutral quantification that sufficiently weak theories of impossibilia are consistent.

However the consistency of limited quantificational ways of talking is insufficient assurance for fuller theories, especially since these limited means do not enable the reflection of important logical features of impossibilia or, for that matter, of possibilia and of entities. The point, yet to be developed, is that neutral quantification logic is not syntactically rich enough to provide the distinctions needed: reinterpreted quantificational logic stands in need of enrichment by further predicates and connectives to bring out recognised features of objects that do not exist.

Beyond the sheltered logical environment of reinterpreted quantification logic, neutral logics are far from uniquely determined. One important choice, for example, is as to whether certain alleged truth value gaps are to be closed, and if they are more than apparent how they are to be closed; whether sentences like (1) and (2) which directly designate nonentities have truth-values, and if so whether they have truth-value true or truth-value false. At this stage semantical (and metaphysical) considerations do enter. For other value assignments for (1) and (2) can be consistently adopted[1] than those Meinong made, that is than those that have been defended as correct, and will be assumed in the major investigations that follow.

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[1] Some features of the non-Meinongian neutral logics which result from different assignments are outlined below.

Once the theory is augmented, especially if by versions of the Characterisation Postulate, which yield truths like (1) and (2), the consistency problem tends to arise again, more acutely. It is probably the most common of the many allegedly fatal objections to any theory like Meinong's theory of objects that it is inconsistent, and therefore worthless, trivial, etc. It is of the utmost importance to observe, first of all, that the final inference made fails in general. Many inconsistent theories are not trivial (in the sense of admitting everything),[1] and are far from worthless (see the argument of RLR, especially 1.7). A major option - not to be lightly dismissed, though the ideas involved run completely counter to the philosophical tenor of the times - is that a really satisfactory theory of objects will be a nontrivial inconsistent theory. But this is not really an historical option.[2] Even in the case of Meinong's theory the historical evidence is, when accumulated, rather decisively against the inconsistency interpretation; for example, Meinong rejected Russell's contention that the theory of objects was inconsistent (cf. Mog., and see the historical discussion in chapter 5 below).

It is likely to be argued, however, that quantification logic cannot be kept, that some classical laws of logic have to be modified, once impossible items such as Primecharlie (the first even prime greater than two) are properly admitted. For either "Primecharlie is not prime" and "Primecharlie is prime" are both true or they are both false. There is no rationale, so it is claimed for the two remaining possible assignments. Thus for some predicate f, (Primecharlie) f and ~(Primecharlie) f. If both statements are true, in virtue of (allegedly assumptible) properties Primecharlie does possess, 'is prime' provides a suitable predicate: if both are false, e.g. because Primecharlie does not exist, the predicate 'It is false that ... is prime' suffices. Therefore for some predicate, the syntactical law of non-contradiction (SLNC) (Ux) ~(xf & ~xf) fails. Similarly the syntactical law of excluded middle (SLEM) (Ux) (xf v ~xf) fails. Since however these principles follow at once for neutral quantification logic, various classical laws of logic have to be restricted in scope. For instance SLNC holds at most for possibilia and entities, SLEM at most for entities and for other items in respects for which they are definite. So contrary to the assumptions of neutral logic, reinterpreted classical quantification logic does not hold for all nonentities.

Meinong's theory may appear especially vulnerable to this criticism. For where a is Meinong's round square both "a is round" and "a is not round" are true according to Meinong's assignments (this follows from the truth of (1) and (2)). Thus SLNC apparently fails. Indeed any impossibilium will have some property for which SLNC is flaunted. Nor is SLNC the only law to fail. Meinong at one stage argues that for certain non-characterising predicates f and ~f of a possibilium a it is false that a has these properties i.e. ~af & ~(~af). For example, since Kingfrance is not determined with respect to baldness both

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[1] Such theories do not of course include quantificational theory in the usual sense in which the rules are unrestricted. For the inconsistency construal, the rules have to be regarded as systemic (i.e. applying only to theses of the system).

The interpretation of the theory of objects as an inconsistent theory will be considered in much detail in subsequently, in particular in chapter 5. But it is important to follow through the consistency route, since this yields information and distinctions required for the inconsistency route as well.

[2] Perhaps Heraclitus was an exception? The Heraclitean fragments seem to leave the issue deliciously open.

Dialectical theories, on the other hand, were never theories of objects, but commonly linked with, what the theories of objects help to refute, idealism.

(5) Kingfrance is bald, and

(6) Kingfrance is not bald

are false.[1] Under this assignment of truth-values, SLEM, af v ~af, apparently fails.[2] In fact, given the usual relations between '&' and 'v', apparent violation of SLEM follows directly from the apparent violation of SLNC (e.g. by (1) and (2)).

That classical laws of logic have to be qualified, that they no longer possess universal validity, and in particular that LNC no longer has universal validity, was Russell's chief objection to Meinong's theory of objects.[3] Meinong dismissed this objection[4] on the ground that no one would ever think of applying *these logical principles* to anything but the actual or at most to the actual and possible. He argued that exceptions to logical principles which are confined to impossibilia, or even to non-entities, are not important limitations of these principles. In addition the typical, and Aristotelian, applications of these logical principles, and standard defences of them, occur in settings where existential presuppositions *are* made, and where restrictions to entities are normally assumed.

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[1] By contrast, the statement
(5'): The present bald king of France is bald, is true when the context does not supply existential loading and false when it does supply such loading. For in the second case (5') will imply, what is false, that the present bald King of France exists. It follows that the present bald King of France is a distinct possibilium from Kingfrance, since he has an extensional property, being bald, which Kingfrance does not.

[2] The assignment of falsity to both (5) and (6) does not violate the Independence Thesis; for the assignment is based, not on the non-existence of Kingfrance, but on the indeterminacy of Kingfrance in certain respects.

An alternative neutral theory under which both (5) and (6) are not truth-valued, with values true or false, because indeterminate or because Kingfrance does not exist, can be developed. But such a theory is liable to infringe the Independence Thesis. Moreover under any such theory a satisfactory treatment of beliefs, fears, wishes and so forth about possibilia is complicated. Since people believe propositions, propositions without truth values have to be introduced. And the proposition that a believes the proposition that p will be true or false even when p is not truth-valued.

[3] B. Russell 05.

[4] A Meinong, Über die Stellung der Gegenstandstheorie in System der Wissenschaften (1907), p.14 ff. Russell's rejoinder, in his review of Meinong's book in Mind vol. XVI (1907), p.439, that LNC is asserted not of subjects, but of propositions, simply evades the issue. For Meinong was concerned with the well-known traditional formulation of LNC as: for any item (subject) and any property, it is not the case that the item both has and lacks that property. He was not repudiating the semantical thesis that no propositions are both true and false, or, to put it in his (non-equivalent) way, that no objectives both obtain and do not obtain. Indeed it is evident that Meinong adhered to a bivalence principle for objectives.

It was Russell, moreover, who was unhistorical: for in the traditional formulation, which had wide currency at the time Russell was writing, SLNC is asserted of subjects.

Russell's own theory appears to lie open to similar objections. For, firstly his theory brings out both bald (Kingfrance) and not-bald (Kingfrance) as false, and hence apparently violates LEM. Secondly, his theory of classes apparently - before contextual conditions come into play - violates LNC (see Carnap's criticism in MN, pp. 147-9). And, in a way resembling the class theory, Russell's theory of descriptions can be so amended that LNC rather than LEM is apparently flaunted; for example so that, neglecting scope, $(\iota x\ xf)$ iff there exists a referentially unique f which is g or also there does not and every f is g (i.e., for the last clause, $(x)(xf \supset xg)$). The reformulation has the advantage that under it both (1) and (2) are true yet (5) and (6) remain false; thus it approximates the assignments of the theory of objects rather better than Russell's theory (the drawbacks of the *Reformulated Theory of Descriptions*, as it is henceforth called, are explained in chapter 4). Thus too it furnishes an elementary consistency proof for a non-neglible portion of the theory of objects. Indeed a theory containing versions of every one of the theses M1 through M7 (set out on pp.2-3) can be demonstrated consistent by elaborating this method.[1]

Russell would quickly point out that on his theories any violations of logical laws are only apparent - that when descriptions are eliminated through their contextual definitions apparent violations of LEM disappear. Meinong can, and does, make a somewhat similar reply to objections that his theory infringes fundamental logical laws:-

The inconsistencies are only apparent. For the arguments used depend upon equating 'a is not f' (e.g. 'Primecharlie is not prime') with 'It is not the case that a is f' ('It is not the case that Primecharlie is prime'), upon confusing negations of different scopes. The arguments presented in favour of abandoning such "negation" laws as SLNC and SLEM only hold provided that negations of significant sentences are taken to be of just one sort: the sort represented in classical quantification logic. The arguments fail if we are prepared (following Meinong) to distinguish two sorts of negation, wider negation and narrower negation. Using wider negation SLEM holds without restriction. But with narrower, or *predicate*, negation LEM does not always hold. To illustrate: (5), symbolised 'k bald', and (6), symbolised 'k ~bald', are false. But ~(5), i.e. ~(k bald), where '~' represents here classical sentence negation, is true, since (5) is false. So though PLEM - instantiated k bald v ~k bald - fails, SLEM - instantiated k bald v ~k bald - holds in virtue of truth-table assignments for sentence negation. Thus

(i) $\sim xf \vee xf$

holds for all x, though

---

[1] The methods has its limits. For consistency depends on the eliminability of descriptions and on not treating descriptions as full logical subjects. Without the latter inconsistency would quickly ensue from truths of the apparent form $(\iota x(xf \,\&\, \sim xf))f \,\&\, \sim(\iota x(xf \,\&\, \sim xf))f$.

(ii) x ~f ∨ xf

does not. Similarly, because (5) is true but (6) is false

(iii) ~xf → x ~f

does not hold generally.

Likewise though predicate LNC, PLNC, does not hold generally, SLNC is valid without qualification. To illustrate: the statement "It is not the case that Meinong's round square is round", symbolised '~mrs round', is distinct from the statement "Meinong's round square is not round", which is symbolised 'mrs ~round'. The statements are not even equivalent; for as (1) is true the first statement is false, whereas the second, (2), is true. So though ~(mrs round & ~mrs round) is true, the corresponding predicate form ~(mrs round & mrs ~round) is false. More generally, while

(iv) ~(~xf & xf)

holds for all x,

(v) ~(x ~f & xf)

does not hold generally. Similarly because (2) is true but (1) is false, the converse of (iii)

(vi) x ~f → ~xf

does not hold generally: it fails for some features of impossibilia.

Given the distinction between predicate and sentence (internal and external, or narrower and wider) negation, there is an ambiguity in such syntactical laws as LEM and LNC between predicate and sentence forms. The principles which, according to Meinong, have a limited scope are the predicate laws; the sentence laws are, as Russell averred, not so restricted in application. The syntactical laws have in turn to be distinguished from such semantical principles as that every proposition is either true or false and no proposition is both true and false; in the consistent theory of objects such principles are not in dispute, (and the semantics subsequently adopted will vindicate them).

According to the consistent theory of objects, the traditional and widespread idea that impossible objects are quite beyond logical reach (that they violate the fundamental laws of logic, are not amenable to logical treatment, and hence cannot be proper subjects of logical investigation) depends upon the long-standing confusion between attributing inconsistent properties to an item (e.g. f and ~f) and inconsistently attributing properties to it (e.g. saying it has f and that it is not the case that it has f). Only in the second case would impossibilia be beyond the scope of a consistent logic. It is now evident that this hoary confusion can be cleaned up by making an appropriate negation scope distinction.

Through his distinction, in the theory of incomplete objects, between wider and narrower negation, Meinong has thus provided the apparatus for a consistent logical treatment of impossibilia. Meinong explained this as the distinction between Nichtsosein or not-so-being, which may be taken as the presence of the opposite property, and das Nichtsein eines Soseins or the not-being-of-a-so-being, which may be explained as the absence of the property (Mog, pp.171-4). Meinong makes the contrast in terms of the form 'A has B' (or 'A possesses B'). The contrast is between 'A lacks B', i.e. 'A does not have B' (*Nichtsosein*) and 'It is not the case that A has B' (*das Nichtsein eines Soseins*). The distinction transforms into modern logical form upon replacing 'A' by 'a', B by 'f-ness', and using the equation: x has f-ness iff xf: then the contrast is precisely between $x{\sim}f$ and ${\sim}xf$. Given this negation scope distinction impossibilia can be admitted as full logical subjects, and the Characterisation Postulate can be applied to them without inconsistency to provide appropriate properties. Thus, for example, Meinong's round nonround is, by the CP, both round and nonround, and so has the properties of roundness and non-roundness; whence, particularly, some object, namely an impossible one, has the properties of roundness and nonroundness. The semantical law of non-contradiction, according to which no proposition is both true and false (or, what is equivalent under commonly made assumptions, that it is not the case that both xf and ${\sim}xf$), is not thereby violated, because internal negation does not imply wider or external negation; in particular that x is not round does not imply that it is not the case (or false) that x is round. And there is no inconsistency in Meinong's position because the law of noncontradiction (and similarly the law of excluded middle) holds generally only for external negation, not for internal negation (Stell, p.14ff; Mog, p.275).[1] According to Meinong, the object "something blue", for example, is undetermined in respect of extension, it is neither extended nor not extended, and the principle of excluded middle breaks down (at least for internal negation). But with the wider negation (*erweiterte Negation*) as in the truth "It is not the case that something blue is extended", the principle of excluded middle applies without restriction.

The admission of inconsistent objects to assumptibility inevitably raises, yet again, the charge that Meinong's theory, whatever its pretences to consistency, is irretrievably inconsistent. The usual support for the objection maybe generalised thus: where L(y) is a law of logic for arbitrary y, the item x which violates L, i.e. $\iota x{\sim}L(x)$, yields a case of ${\sim}L(y)$, i.e. ${\sim}L(\iota x{\sim}L(x))$, and hence renders the theory inconsistent, since $L(\iota x{\sim}L(x))$. But of course, $\iota x{\sim}L(x)$ is not assumptible, i.e. the Characterisation Postulate does not apply. The idea that it does apply completely generally is a product of the uncritical transfer of the logic of entities to nonentities. But, as we have already glimpsed through the Reformulated Theory of Descriptions, there are ways of consistently elaborating Meinong's general theory of objects which do not give away any of its essential features, by qualifying the Characterisation Postulate appropriately. For example, on the consistent theory sentence negation cannot figure in the Postulate; for an item cannot determine of itself what it excludes.[2] There is clear textual evidence,[3] furthermore, that Meinong did want to qualify the Characterisation Postulate; e.g. he wanted to exclude certain factuality and existence predicates from assumptibility (UA, pp.70-1; Mog, p.278 ff.) However the qualifications Meinong would have imposed, which are entangled with the semantical doctrine of the modal moment, remain syntactically obscure, and may well have been noneffective. Since the abstraction axiom of set theory is, given an obvious definition of set abstracts (viz. $\hat{x}A(x) = \iota y(z)(z \in y \leftrightarrow A(z))$ a special case of the unqualified CP, the problems of obtaining proper qualifications for the Characterisation Postulate are no less difficult than those of obtaining them for the abstraction axiom. Thus Meinong's failure to present clear effective qualifications can scarcely be regarded as detracting substantially from his achievement, any more than Cantor's failure to provide effective qualifications on the abstraction axiom detracted from his achievement in set theory; and it would be just as unreasonable to abandon the theory of objects on the ground that a naive version is inconsistent as it would to abandon set theory merely because naive versions are inconsistent.

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[1] It is worth noting that a similar negation scope distinction and rule has recently proved fruitful in providing semantics for a class of non-modal intensional functors (see RLR; ABE, p.48): the distinction is similarly expressed in natural language, as the distinction between describing an inconsistent situation (e.g. as one to which some proposition and its negation both belong), which is a perfectly consistent activity, and inconsistently describing a situation (e.g. as one to which some proposition both belongs and does not belong).

[2] This ties with the older intuition that an object cannot be defined negatively, and also with more modern ideas, from theories of orders that ${\sim}af$ does not, unlike af, determine a first-order feature of a (for appropriate f).

[3] See also chapter 5. The important matter of qualifications on the CP is much discussed in later chapters, especially chapter 5.

Consistency of the unreduced[1] theory of objects turns on a distinction between negations (more accurately, on differences in negation locations). Logical empiricists have, however, argued (completely in character) against making a distinction between sentence and predicate negation. Russell, for one, claims that negation is always sentence negation (LA, 212). But Russell's objection to predicate negation fails once it is conceded, as his own theory of descriptions lets us conclude, that there may be two ways of negating assertions; for then there is no objection to having "~k bald" true and "k~bald" false. In effect two sorts of negation appear in Russell's work, distinguished by scope differences; consider, for instance, ~(5), i.e. on the conflation (6). On Russell's theory of descriptions this disambiguates into the following two forms according as different scope of ~ is taken, namely (in orthodox notation) $\sim[\iota xk(x)]b(\iota xk(x))$, which corresponds to ~(5), and $[\iota xk(x)]\sim b(\iota xk(x))$, which corresponds to (6). Thus the very distinction the consistent theory of objects requires is already respresented in PM, at least in the surface grammar. Consider too the distinction between '~(...=...)' and '≠' in PM,*... In other words, the distinction between sentence and predicate negation can alternatively be brought out by introducing scoping brackets, or by a scoping predicate. By using the predicate 'T', read 'it is true that', or less satisfactorily (in Prior's fashion) 'it is truly said that', one can distinguish '~T mrs round' and 'T~mrs round', corresponding to '~mrs round' and 'mrs ~round'.

Use of 'T' suggests widening the negation distinction so that predicate negation is replaced by a narrower negation which now however applies generally to sentences; and then use of scoping predicate 'T' is just equivalent to introduction of narrow negation. There are advantages too in extending the negation distinction; for the notion of predicate negation tends to put too much weight on the specific syntactical form of sentences to which it applies, and in the case of sentences containing several connectives raises awkward questions as to whether the predicate negation is invariant under different selections of sentence subjects (in fact it seems to be). It is somewhat easier, both syntactically and semantically, to work with connectives which operate on sentences and not just on special sorts of sentences or parts of sentences. Accordingly, let us introduce the symbol '$\bar{\ }$' to represent internal negation: $\overline{A}$, which is well-formed when A is, is the internal negation of A. Where A is expressed in subject predicate form, say $\underset{\sim}{x}f$, then $\overline{A}$ may be abbreviated $\underset{\sim}{x}{\sim}f$.

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[1] The matter is different if the theory reduces, i.e. discourse about nonentities can be eliminated, in one way or another, in favour of discourse about entities, e.g. through a theory of descriptions or a bundle theory construing nonentities as sets of properties.

Instead of being pulled out, and extended to a sentence connective, predicate negation may be pushed inward, and absorbed in the predicate, predicates or properties then being said to come in two forms, positive and negative. Such a property restatement of the theory (as it will be called, though some worthwhile generality is lost) has certain advantages: in particular, it helps exclude illicit uses of the Characterisation Postulate, restricting the Postulate in a fairly natural way to "properties" rather than admitting its application simply to wff (all of which are taken, if they contain a free variable, to correspond to predicates). The property restatement of the theory lends itself a little too readily to reductions of the theory of objects, by reducing nonentities to bundles of properties.[1] Some of the initial disadvantages of the property restatement are evident enough, e.g. the serious problem of distinguishing positive from negative properties is introduced, leading thereby to undesirable atomistic elements; the disadvantages can be avoided by sticking with the internal negation formulation, which also has the important virtue of reflecting the data of natural language (rather than trying to force it into a preconceived and narrowly-construed logical mould).

In fact both negations, external and internal, though they can be interdefined using auxiliaries such as 'T', are essential - if the data delivered by natural language are to be taken as presented. The ordinarily understood differences between external and internal negations appear, and have important applications, not only in the inconsistency cases so far focussed upon, but also, and in a perhaps less debatable way, in the matter of incompleteness. The complement of the inconsistency feature, the incompleteness feature of negation, that external negation (~xf) does not generally imply internal negation (x~f), can be valuably applied as by Meinong, to explicate the incompleteness or indeterminacy of nonentities,[2] to account for apparent truth-value gaps, and to solve the historical problem of the One and the Many, of how abstractions can represent many different individuals with incompatible properties (Mog, p.170 ff; see also Findlay 63, p.159 ff).

Consider, first, the apparent puzzle as to the altitude of the golden mountain. How high is the golden mountain? The puzzle evaporates once it is realised that the golden mountain is incomplete in many respects, including altitude. And the requisite incompleteness can be logically represented.

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[1] The defects of the reduction will concern us in later chapters. The reduction does, however, provide a valuable partial model for the theory of objects.

[2] The distinction will also be applied, in chapter 3, in explicating the incompleteness of entities. According to Meinong, however, objects which exist or subsist are determinate in every possible respect (Mog. p.180; also GA I, Stell). This thesis, which gets Meinong into some difficulties (cf. Grossmann 74, p.178; Findlay 63, p.156), is argued against in detail subsequently. Neither entities nor the objects Meinong takes to subsist are always fully determinate.

Let f represent a feature such as being a 1000 yards high, or 1001 yards high. Then to say the golden mountain is incomplete as regards f is to say that the golden mountain is neither f nor not f. Similarly (as Meinong also explains in GA, pp.466-75; also Stell) the round square is neither blue nor is it not blue; it is incomplete in fact with respect to colour determinations. What have been (mis)taken as truth-value gaps are really cases of incompleteness.

The traditional problem of how abstractions or generalisations can represent, or be exemplified by, particulars with incompatible features is also explained very simply on the assumption that such objects (e.g. nonattribute universals such as the Triangle) are (necessarily) incomplete items, incomplete with respect to most properties other than those that follow from their characterisations. In this way there is no difficulty about supposing that a universal such as the Triangle, which is indeterminate with respect to property g (say equiangularity) can represent both individual triangle a_1, which has g, and individual triangle a_2, which has ~g. Since objects such as the Triangle are incomplete they are open to further determination, they can be "filled out", in different ways, by further characteristics; and this is what happens in exemplification by particulars. The incompleteness of nonentities, whether particular or universal, is explained through the negation distinction by the feature that, contrary to the underlying assumptions of standard logic, such items may have neither f nor its internal negation $\bar{f}$ for some trait f. For the failure to possess feature f does not guarantee that it possesses its opposite $\bar{f}$; e.g. the fact that it is not the case that the present King of France is wise does not imply that the King of France is not wise, that it is not the case that the Triangle is isosceles does not imply that the Triangle is not isosceles; for though the antecedents are true the consequents are not. On these truth-value assignments to statements about the present King of France the theory agrees on the surface with Russell's theory (Findlay 63, p.160; *contra* Passmore 57, p.229), but in fact it is only agreement in a limited way since the Russellian theory effectively treats *all* properties of nonentities as indeterminate. The famous examples concerning the present king of France are typically used to illustrate just this point, that nonentities have no genuine properties, but only reanalysable features like nonexistence and "secondary" ones such as intensional features. But it does not follow from the fact that many questions about nonentities have no correct answers that *none* of them have correct answers, or that nonentities have no genuine properties. Partial indeterminacy does not entail total indeterminacy.

Recognition of the incompleteness, or partial indeterminacy, of universals enables the rectification of Locke's inconsistent account of abstract notions and avoidance of Berkeley's celebrated criticism of abstractions. Locke went wrong in implicitly applying a predicate LEM to universals, in assuming that if the Triangle is not non-g (e.g. non-scalene) then it is g (scalene). For then as the Triangle is not non-scalene, since some triangles are not non-scalene, the Triangle is scalene. But it is also not scalene, since some triangles are not scalene. So results the inconsistent Lockean triangle that has both all and none of many of the properties of particular triangles:

> the general ideal of a triangle ... must be neither oblique nor rectangular, neither equilateral, equicrural nor scalene; but all and none of these at once. In effect, it is something imperfect, that cannot exist, an idea wherein some parts of several different and inconsistent ideas are put together. It is true, the mind, in

> this imperfect state, has need of such ideas, and makes all the haste to them it can, for the conveniency of communication and enlargement of knowledge.
>
> (Locke, 75, IV. vii. 9).

Remove the completeness assumption, forced logically by the predicate LEM, and the inconsistency vanishes. There is then no need to say that the Triangle has all the properties of particular triangles, but only some of them and Berkeley's objections (49, Principles, Introduction §13), which likewise rely upon predicate LEM, fail.[1] An apparent antinomy is, however, thought to remain.

> For though the abstract, general idea as specified by Locke "is something imperfect, that cannot exist" it apparently has to, if understanding, "communication and enlargement of knowledge" are to be possible. And they obviously are, since they do in fact occur (Flew 71, p.434).

But the argument turns on the Ontological Assumption: otherwise we can say what we do say, that communication does not require reference, but may be about what does not exist, such as incomplete objects. It is not true then, as Flew and many others have claimed, that

> Locke and Berkeley together succeeded in erecting a decisive 'No through road' sign against one tempting opening (Flew 71, p.436).

Meinong marked out the through route (which we will follow in later chapters).

In terms of partial indeterminacy, other puzzles, sometimes taken as serious obstacles for theories of items, can also be surmounted. Findlay, for instance, claims a

> fatal weakness in the objects which have no being is that some of them are not fully determined, and about such objects few questions can be significantly asked (63, p.57).

But indeterminacy does not render questions about indeterminate objects non-significant, and far from being a weakness of the theory is a source of strength. Findlay,[2] however, apparently considers it a fatal weakness of Meinong's theory of objects that it admits any number of "insoluble" problems - problems which arise because some items are not determinate in all respects. Thus

> the folly of the problems which ... perplexed the senile mind of Tiberius: what songs did the sirens sing or who was the mother of Hecuba?

But, once again, Tiberius's questions are certainly significant; for one thing it is a contingent matter that Hecuba did not exist, so he might have been asking of a person that did exist, for another it is true that Florence Nightengale was not the mother of Hecuba. Furthermore the "problems" are explained, as Findlay in effect observes, through recognition of indeterminacy, and only appear insoluble on 'the assumption that Hecuba had a definite mother, or that the sirens sang a perfectly determinate song'. In short, no insoluble problems arise.

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[1] Berkeley's own alternative account (hailed by Hume as an intellectual breakthrough), of an arbitrary particular triangle 'standing for and representing all triangles whatsoever' and being 'in that sense universal' encounters serious difficulties (despite Berkeley's disclaimer that it seems 'very plain and not to include any difficulty in it') as soon as one asks for details of the representing relation and the meaning of universal terms, which, at least on Berkeley's account, are not eliminated.

[2] Inconsistently with what he has subsequently to say about the indeterminacy of incomplete objects.

Thus Findlay has not here discerned a fatal weakness in nonentities. That such questions as 'Is the present king of France bald?' and 'Who was the mother of Hecuba?' are significant follows from the significance thesis (I) (and question-declarative sentence connections). Nor are the questions insoluble in any ordinary sense. We know, for example, that it is false that the present king of France is bald. It is important to distinguish indeterminacy from insolubility. To say that a question is insoluble presupposes that it has or should have a determinate answer, which for some reason cannot be decided by given methods. The questions which result in indeterminacy in the theory of items do however have definite true or false answers, for which the particular truth-value can be decided: so these questions are not insoluble. It is not a defect of a theory of items that certain questions have indeterminate answers, particularly when this indeterminacy follows, as it does, from certain truth-value assignments.

For a is indeterminate in respect of f (or f-ness), or af is indeterminate if af is false and a~f is also false, i.e. ~af & ~a~f. Thus for instance, (5) and (6) are both indeterminate because both false. But indeterminacy is not restricted to such cases: indeterminacy may also arise in somewhat more complex ways. Consider, for example, the hotel, which in fact is merely possible (but in suitable stories it may be planned or even exist in part), which I am thinking of. Since it is a hotel it is presumably true that it has some rooms. But because of incompleteness in the specification of the hotel it is not true that it has one room, not true that it has two rooms, and so on. Generally it is not true for any given number n that it has n rooms. (On these latter assignments the theory agrees with Russell's theory). A logic which allows as true for some f:

~0f, ~1f, ~2f, ..., ~nf, ... ; (Pn)nf

is ω-inconsistent.
But even if the logic arrived at were to reflect such features of possibilia, it would not be at all damaging. For one thing, inconsistency proper would not result. This sort of ω-inconsistency does nothing to condemn a theory of possibilia: to exhibit it would be a merit of the theory.

It is not determinate how many rooms the envisaged hotel has. Thus the above ω-inconsistency suggests further sufficient conditions for indeterminacy. If ~nf holds for all natural numbers n despite (Pn)nf, then kf is indeterminate. In this case the best answer to the question 'Exactly how many x are f?' is: It is indeterminate how many x are f, exactly how many rooms the hotel has.[1] And again the indeterminacy is explained through negation features.

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[1] Similarly, even if it is said to be true that some distance is the mean distance between the planet Vulcan and the star of Bethlehem, because both are heavenly bodies in some common space, it is false that the mean distance between the planets is n light years for any specific n, so the distance is indeterminate. Compare the situation in modal logic where, for example, it is logically necessary that some number is the number of planets in our solar system, but it is false that it is logically necessary that n is the number of planets for any specific n.

§11. *The inadequacy of classical identity theory; and the removal of intensional paradoxes and of objections to quantifying into intensional sentence contexts.* Neutral quantification logic, enlarged by internal negation and the predicates 'E' and '$\Diamond$', gives no trouble so long as it is not applied to intensional discourse; once it is applied there is trouble, much trouble with the classical formal theory, in particular with identity theory and description theory.

Standard identity logic is based firmly on the Reference Theory. Since intensional "paradoxes" and prohibitions on quantifying into intensional frames (e.g. binding variables inside intensional functors by quantifiers exterior to the functors) both derive from standard identity logic, both derive ultimately from the Reference Theory; and both are removed with rejection of that theory. In short, the so-called problems are once again generated by that faulty theory, and removed with its demise.

The classical logical theory is encapsulated in the definitional equivalence (PM, *13.01, Church 56, p.301)

$x = y$ iff $(f)\ (xf \supset yf)$ (LL, Leibnitz's Law, or bettei, Leibnitz's Lie),

commonly traced back to Leibnitz. The theory may be equivalently formulated, $x = y$ iff $(f)\ (xf \equiv yf)$ since symmetry follows from the implicational form, and, more interestingly:

if $x = y$ then $xf \supset yf$ (IIA, i.e. full indiscernibility)[1]

given only reflexivity, i.e. $x = x$. As Whitehead and Russell say (PM, 23)

> If x and y are identical, either can replace the other in any proposition without altering the truth-value of the proposition; thus we have
>
> $\vdash : x = y .\ \supset .\ \phi x \equiv \phi y.$
>
> This is a fundamental property of identity, from which the remaining properties mostly follow.

Indeed with reflexivity the remaining properties entirely follow. For all classical properties flow from LL, IIA yields one half of LL by quantification logic (generalisation and distribution), and the other half of LL results from the following case of instantiation, $(f)(xf \supset yf)\ \supset .\ x = x \supset .\ x = y$, by commuting out $x = x$.[2] In first order quantification logic, where attribute quantification is not catered for, and so identity is not definable, reflexivity and

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[1] For the second order schematic form, see Church 56, p.302.

[2] Linsky (77, 115-6) has lost sight of this elementary argument for the identity of indiscernibles. For he vigorously defends indiscernibility of identicals and (later in 77) reflexivity of identity, yet sets aside as a separable issue Wittgenstein's objection (in 47) to the identity of indiscernibles.

Wittgenstein's objection, at least as stated, is not telling: it rests on a confusion of nonsense and logical falsehood. According to the objection,

> Russell's definition of '=' [i.e. U] is inadequate, because according to it we cannot say two objects have all their properties in common. (Even if the proposition is never correct, it still has sense.)

But $a \neq b\ \&\ (\phi)(\phi a \equiv \phi b)$ is significant and can be said on Russell's theory; it is simply never correct.

IIA provide the standard axioms for identity. However IIA is usually restated schematically - to avoid the complexities of substitution upon predicate variables in quantificational logic - as follows:-

> u = v ⊃. A ⊃ B, where B results from A by replacing an occurrence of term u by v, provided the occurrence of u in A is not within the scope of quantifiers binding variables in u or v (IIA scheme).

The classical theory of identity derives from the Reference Theory (as has already been demonstrated, in one way, in §6). Briefly, since according to the Reference Theory truth is a function of reference, if u and v are identical, i.e. have the same reference, then A(u) is true iff A(v) is true, by functionality (i.e. applying the definition of function); that is IIA holds. More elaborate arguments for full indiscernibility similarly rely on the Reference Theory. Consider, for example, Linsky's "proof" (77, pp.116-7):

> Any singular term ... replaced [with an appropriate variable] in a true statement refers to an object that satisfies the open sentence thus constructed. An object satisfies such an open sentence only if replacing the open sentence's free variable by any singular term making reference to the object turns the open sentence into a true statement. ... Consequently the result of replacing a singular term in a true statement by any other singular term referring to the same object leaves the truth-value of the last statement unchanged. Terms of a true identity statement refer to the same thing.

The thesis that truth is a function of reference is already built into the premisses, critically through the italicised any in the second statement. The premisses are, as we shall come to see, false. Consider the supposed truth (about the inquiring child J; cf. Linsky, p.63) 'J wants to know whether Hesperus = Phosphorus'. Then the object Phosphorus satisfies the open sentence 'J wants to know whether Hesperus = y' according to Linsky's first premiss. But as Hesperus = Phosphorus the term 'Hesperus' is a singular term making reference to the same object, yet it is not true that J wants to know whether Hesperus = Hesperus. So by the second premiss the object Phosphorus does not satisfy the given open sentence. Identity of reference does not always suffice for replacement preserving truth.

Not only does the classical theory derive from the Reference Theory: without the Reference Theory the classical connections are in doubt or fail. Consider, as a vehicle for making the latter point, the stock argument to secure a full-strength (substitutivity of) identity principle, the Indiscernibility of Identicals Assumption. The stock argument runs as follows: If a and b are identical then a and b are one; therefore whatever is true of or can be truly said of or about a should equally be true of or about b since b is nothing but a. Given a purely referential theory of identity - to the effect that identity (and difference) sentences relate just to the referents of expressions standing on each side of identity (and difference) signs, and that truth is determined just through reference - full indiscernibility is of course inevitable. But more important, unless such a theory is adopted, the argument is not cogent. For suppose that truth depends not just on reference but on some other factor as well: then oneness of reference of a and b fails to guarantee that what is true of a is true of b because the further factor may not transfer from a to b. Since sense is such a further factor the inadequacy of a purely referential theory emerges directly from Double Reference Theories such as Frege's.[1] And a solid case, grounded on intuitive examples, can be put up for claiming that with an identity sentence, such as 'a = b', not only the referents of 'a' and 'b' but also their senses are relevant. For instance, in 'Necessarily a = b' what is said is said not just about the referent of 'a', if any, but involves more, e.g. the sense of 'a'. Then, however, the conclusion of the stock argument does not ensue. Truth will only be preserved under substitution of (extensional) identicals where only referential features are in question, i.e. (more exactly) in extensional contexts. The resulting undermining of the full-strength identity principles has however not been sufficiently noticed, and is not admitted by Frege though his identity principle is effectively qualified through the theory of change of references in oblique contexts.[2]

That the stock argument for the referential theory lacks cogency in fact emerges directly from examples. For there are any number of cases where a and b are in fact identical but what is true of a, e.g. believed or known or thought or conjectured of a, is not true of b. The stock argument also fails in a similar fashion where quotation affects replacement, but it is only in such cases that an exception to full replacement is recognised. In the face of this failure, qualifications are frequently imposed on the substitution principle with respect to sentence contexts containing quotes, e.g. the principle is said to apply only to first-order contexts or the inevitable use-mention distinction is wheeled out. But, in spite of the similarities, analogous qualifications are not usually imposed on sentence contexts containing intensional operators. Why is the Indiscernibility of Identicals Assumption adhered to so tenaciously in such cases but not in quotational cases? Because, once again, of the Reference Theory. The way in which the name-object (mention-use) distinction removes apparent counterexamples to indiscernibility (e.g. replacement using Cicero = Tully in ''Cicero' contains six letters') fits snugly into the Reference Theory - mentioning expressions are simply further names referring to linguistic objects - whereas intensional expressions do not fit, at least not without severe distortion, into that theory. The mental paralysis the Reference Theory induces has even led to the idea that all failure of full indiscernibility must be due to the intrusion, somehow or other, of reference to names and not merely to objects. Thus Quine (FLP, p.140):

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[1] See Frege GB, pp.56-7. Even Quine, who relies on what amounts to the stock argument to get his critique of modality moving (cf. FLP, p.139) comes close to repeating some of Frege's points when he writes 'Being necessarily or possibly thus and so ... depends on the manner of referring to the object' FLP, p.148.

[2] Effectively qualified - though seen differently from Frege's own standpoint, the sense-reference theory amounts to a rescue operation for full indiscernibility: see §7.

In the discussion of a further factor, sense is of course only illustrative. The further factor to be taken account of is not really sense, but nonreferential use. Senses are special entities cooked up precisely to obtain the effect of the requisite qualification of LL, without openly challenging its referential character.

> Failure of substitutivity reveals merely that the occurrence to be supplanted is not fully referential,[1] that is, that the statement depends not only on the object but on the form of the name. For it is clear that whatever can be affirmed about the object remains true when we refer to the object by any other name.

What is said to be clear is clear only given assumptions of the Reference Theory: otherwise it is clear that, when name 'a' differs from name 'b' but a = b, what may be truly affirmed of a, such as that it is necessarily identical with a, may not be truly affirmed of b. Substitutivity (i.e. full indiscernibility) fails not only when the statement depends on the form of the name; it commonly fails for intensional frames which cannot be reconstrued as somehow linguistic or about names.[2] A basic false dichotomy between references (objects) or names of references, also a product of the Reference Theory, underlies the assumption that what is not about a reference and resists substitutions must somehow be about a name, and accordingly must be paraphrased linguistically to reveal its "true logical form", a referential one.

Of course a linguistic surrogate of the full substitutivity principle can be kept by the terminological strategy of suitably narrowing the application of 'property', 'condition' or 'trait' (or for that matter by a high redefinition of 'true of') so that sentence contexts or sentential functions containing intensional or modal operators do not specify properties or traits. But there does not appear to be much justification for this piece of legislation; it is methodologically much preferable to distinguish sorts of properties, e.g. extensional properties or referential properties among properties. A more insidious strategy for hanging on to full substitutivity, which is correspondingly harder to undercut, appeals to a division of subjects into logically proper subjects, e.g. proper names of some kind - for such subjects there are no failures of substitutivity - and remaining subjects, e.g. descriptions, statements concerning which are analysed away through supposedly equivalent statements concerning proper subjects. Such a strategy, which fits snugly into the referential framework, represents the prevailing approach to problems of identity in nonreferential settings: indeed it is often taken, quite mistakenly, as the only viable, or even possible, approach to the problems. Such a referential strategy runs, as we shall gradually see, into insuperable difficulties. Moreover there is a viable, albeit nonreferential, alternative: namely qualifying indiscernibility.

Abandoning full indiscernibility removes at once certain traditional and modern puzzles about identity. A first puzzle generated by the Reference Theory lies in explaining how identity can have any (logical) importance and identity statements be other than trivial.

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[1] This it does show, but in our sense, not Quine's.

[2] For a multiplicity of reasons; e.g. the referential theory of names does not permit translation to other languages, but intensional expressions can be translated; the replacement conditions for linguistic expressions are wrong for intensional expressions; etc. Compare too the objections to theories in the Fregean mode, §7.

> It might be thought that identity would not have much importance, since it can only hold between x and y iff x and y are different symbols for the same object.[1] (PM, p.23).

Whitehead and Russell try to escape this difficulty their theory leads to by appeal to descriptive phrases.[2] But what really happens (though Whitehead and Russell do not explain it, or indeed explain satisfactorily how descriptive phrases get them out of their predicament) is that a theory of descriptions with scoping devices offers a backdoor way of limiting substitutivity of identity. (This will become clear with the explanation of how such a theory of descriptions resolves modal paradoxes.) Frege in effect argued from the differences between a = a and a = b when both are true to the inadequacy of a purely referential theory of identity, and thereby of full indiscernibility (though Frege did not draw the last conclusion his theory precludes referential replacement in oblique contexts and so, in this sense, limits substitutivity). For given full indiscernibility it would be impossible to explain differences between a = a and a = b when both are true yet they may differ significantly in informational content, modal value, and so on. The solution to the puzzle is simply that de facto truths of identity do not legitimate replacement within intensional sentence frames such as those formed with functors such as 'it is trivial that'. For instance the truth, Cicero = Tully does not legitimate single replacement of 'Cicero' by 'Tully' in the statement "It is trivial that Cicero = Cicero".

Secondly, abandoning full indiscernibility eliminates paradoxes that emerge as soon as classical identity logic is grafted onto quantified model logics. The difficulties appear in especially severe form in modal logic S5 (a system defended in EI and RLR as containing essentially the correct sentential logic of logical necessity); but such absurdities,[3] as that all identities are logically necessary, are derivable in any system with good claims to capture logical necessity formally. In logics based on S5 not only is

1)) $(x = y) \equiv \Box(x = y)$

a theorem - a result which holds in weaker systems based on modal logic T - but worse

2)) $(x \neq y) \equiv \Box(x \neq y)$

is a theorem. In combatting this difficulty various moves are possible:

(A) to eliminate 2)) by weakening the modal logic at least to S4, but to keep 1)). But since defences of 1)) have little more plausibility than defences of 2)) and most defences of 1)) can be transformed into defences of 2)), and since even 1)) is rejected by philosophers on various grounds, the source of the trouble does not appear to be S5. And S5 has not just an alibi but also a good defence.

(B) to retain, at least in appearance, the customary (substitution or Leibnitzian) identity criterion along with consequences, in an S5-modalised theory, like 1)) and 2)); to argue that 1)) and 2)) are correct, and that apparent counterexamples are only reached by misconstruing the range-values of variables occurring in 1)) and 2)). By way of restriction it is proposed either

(B_i) To restrict the class of expressions, which can be substituted in the classical identity schemes, and so which can be substituted in 1)) and 2)), to merely referring or naming expressions, to logically proper names or the

(footnotes [1] [2] [3] on next page)

(Footnotes from previous page.)

[1] As with Leibnitz's famous statement of his law, use and mention are conflated in the statement, but in neither case in a damaging way.

[2] Where the Reference Theory leads without epicycling may be seen in Wittgenstein's proposed elimination of identity in the Tractatus.

The Whitehead-Russell appeal to descriptions (or complex names) and to the informativeness of identity assertions formulated with these, is given a revealing turn in Quine (56, p.209). Quine tries to escape difficulties the Reference Theory causes, as to the point and origin of identity statements, by a similar two-fold strategy to that Russell had used, appeals to the imperfection of languages containing complex names and to the informativeness of some identity statements.

Firstly, Quine tries to clear up the difficulty for classical identity theories, that identity statements are always trivial when true, by distinguishing cases like "Cicero = Tully" from cases like "Cicero = Cicero". The statement "Cicero = Tully" is said to be

> informative, because it joins two different terms; and at the same time it is true, because the two terms are names of the same object (p.209).

This clearing up of the difficulty looks just fine (and is fine when indiscernibility is qualified) until we encounter the classical referential theory of identity Quine presents a few pages later (p.212), whereupon we discover that the noninformativeness of "Cicero = Tully" follows from the admitted noninformativeness of "Cicero = Cicero". More elaborate shifts are required than Quine has offered; either 'Cicero' and 'Tully' have to be construed as, what they are not, disguised descriptions and scoping methods brought into play, or noninformativeness and related functors have to be construed as, what they are not, implicitly quotational.

Secondly, Quine tries to make out that 'the need for identity derives from a peculiarity of language'; in the logically ideal language, where language tends to vanish back into that which it copies, identity would be superfluous.

> If our language were so perfect a copy of its subject matter that each thing had but one name then statements of identity would indeed be useless[1]. ([1]Thus it was that Hume had trouble in accounting for the origin of the identity idea in experience ...) But such a [Tractarian] language would be radically different from what we have. To rid language of ... redundancies among complex names ... would be to strike at the roots. The utility of language lies partly in its very failure to copy reality in a one-thing-one-name fashion. The notion of identity is then needed to take up the slack (p.209).

The underlying Reference Theory picture of language is thoroughly misleading, and is pernicious. It leaves out entirely the bulk of language, which consists of nonreferential discourse; it leaves out the language of thought, perception, dreams, theories, imagination, the worlds and objects there discerned, and so on. Nor is it only because of a peculiarity of language that identity is required. This leaves out of account the nature, and limitations of the users of the language, and the point and purposes of their ordinary nonreferential discourse.

[3] Absurdities in the intuitionist sense of really false propositions.

like; that is, in effect, to narrow drastically both the class of objects which subjects 'a', 'b', etc. can legitimately be about and therewith the range of subject variables. Recalcitrant expressions which are not merely referring are replaced by definite descriptions. Or

(B_{ii}) To replace (for certain sentence contexts) the items which subjects designate and over which subject variables range, viz. individuals or objects, by different items, e.g. individual concepts.
Strategy (B_i) is a characteristic Reference Theory move, strategy (B_{ii}) a characteristic Double Reference Theory move.

Both these moves, which are discussed in more detail below, in effect reject the Leibnitzian identity criterion for familiar subjects, such as 'Venus' and 'the evening star', which refer to individuals but which do not merely refer. Moreover they are compatible with the revision of the Leibnizian criterion as applied to familiar referring expressions.

(C) To revise the identity criterion. After all, why should an analysis of identity, like the unrestricted substitution analysis, which is carried straight over from extensional logics where all properties admitted are extensional, be expected to hold without qualification for modalised logics? There is no good reason for expecting it to and good reasons for expecting it not to hold. Accordingly the standard analysis of identity in restricted predicate logics should be challenged and supplanted by a different treatment, under which various identity criteria are distinguished. Even so the appearance of the Leibniz principle could, once again, be kept by adopting a high redefinition of 'property' under which only extensional attributes qualify as properties. But other than 'saving Leibniz' the redefinition lacks virtues; thus a different course is pursued.

Thirdly, abandoning full indiscernibility, in favour of qualified extensional indiscernibility, enables one of Ryle's 'unanswerable' objections to the theory of objects to be met. Ryle argues (72, p.11) that the theory of objects commits Meinong to saying that, since 'the morning star' and 'the evening star' mean different things, true assertions about each are about different stellar things, and that Meinong is accordingly committed to denying plain astronomical facts. Not at all: 'the morning star' and 'the evening star' are not, according to the theory of objects, about different stellar things. The fact that the morning star and the evening star have different intensional properties[1] does not show that the objects are different, without an illegitimate appeal to full indiscernibility. What the intensional discernibility of the morning star and the evening star does reveal is that the expressions 'the morning star' and 'the evening star' do not mean the same, in the sense of not having the same sense. But this would only yield the damaging result that the expressions are not about the same thing given the equation of sense with aboutness, an equation (drawn from the RT) that Ryle quite incorrectly ascribes to any theory of objects.

Perhaps the most important result of abandoning full indiscernibility in favour of appropriately qualified substitutivity is the disappearance of so-called paradoxes of intensionality. Since modal paradoxes are representative of these paradoxes, it will suffice to examine modal paradoxes.[1] Consider then, to illustrate generally the problem indiscernibility causes, a typical modal paradox: It is true that

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[1] Such as being believed by the Babylonians to appear in the morning sky. The examples Ryle deploys fail in fact to serve his intended Fregean purpose; for it is just as true of the morning star as of the evening star that it shone brightly last night.

1) $\sim\Box(\#pl > 7)$

where '#pl' abbreviates 'the number of major planets'. But using the true extensional identity

2) $\#pl = 9$

and applying indiscernibility to substitute identicals in the truth

3) $\Box(9 > 7)$

it follows

4) $\Box(\#pl > 7)$

Since 1) and 4) are inconsistent, yet the premisses are true, this is certainly a paradox - at least on simple referential assumptions.

Looked at differently, in a way that focuses on substitution, substitution using 2) is not truth preserving in 3) but it is truth preserving in

5) $(9 > 7)$.

Therefore the sentence context '$\Box(\ldots)$' is r-opaque. It is well worth detouring to explain opacity and transparency; for these notions are at the centre of the dispute about what the intensional paradoxes show. It is common ground that they show opacity; but what does opacity matter? The tougher empiricist thesis (the source is again the Reference Theory) is that the paradoxes reveal, or help reveal, that there is something seriously wrong with, indeed ultimately unintelligible about, opaque contexts, and so with intensional discourse generally. But all that is revealed is that referential theories are inadequate to intensional discourse.

Criteria for transparency and opacity of sentence contexts vary according to identity criteria used in their characterisation. In what follows the notions are distinguished just for extensional identity (=) and strict identity (≡). A particular occurrence of a subject $\langle x\rangle$ in a sentence context $\langle f\rangle$ is referential if truth-value is preserved under replacement of $\langle x\rangle$ by any $\langle y\rangle$ such that $y = x$, i.e. if $(y).\ x = y \supset.\ xf \equiv yf$; modal if truth-value is preserved under replacement of $\langle x\rangle$ by any $\langle y\rangle$ such that $y \equiv x$, i.e. if $(y)(x \equiv y \supset.\ xf \equiv yf)$. A sentence context $\langle\Phi\rangle$ is r-transparent if for every singular subject $\langle x\rangle$, if an occurrence of $\langle x\rangle$ is referential in $\langle xf\rangle$ (i.e. in context $\langle f\rangle$), then that occurrence of $\langle x\rangle$ is referential in $\langle\Phi(xf)\rangle$, i.e. if $(x)(f)[(y)(x = y \supset.\ xf \equiv yf] \supset.\ (y)(x = y \supset.\ \Phi(xf) \equiv \Phi(yf))$; otherwise $\langle\Phi\rangle$ is r-opaque.[2] A sentence context (of sentences) $\langle\Phi\rangle$ is m-trans-

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[1] Negatively it does suffice, but positively, when it comes to determining appropriate substitution conditions, it hardly suffices. For strict identity which warrants replacement in modal frames does not licence inter-replacement in more highly intensional frames.

[2] These definitions result from Quine's definitions in WO upon introducing quotation functions and distinguishing identity criteria. Note that Quine's informal definitions are not unambiguous; e.g. a more satisfactory definition of r-transparency uses undistributed quantifiers, as in

$$(f,x,y).\ (x = y \supset.\ xf \equiv yf) \supset.\ x = y \supset.\ \Phi(xf) \equiv \Phi(y,f).$$

(footnote continued on next page)

parent if for every singular referring expression <x>, if an occurrence of <x> is modal in <xf>, then that occurrence of <x> is modal in <Φ(xf)>; otherwise <Φ> is m-opaque. All extensional sentence contexts are r-transparent; but the converse does not hold. Sentence contexts of the form '□(...)' and '◊(...)', where no intensional functors occur within the brackets, are r-opaque but m-transparent. It is these features that provide the genesis of modal paradoxes.

What follows from the paradox and r-opacity? As with most paradoxes, quite diverse conclusions have been drawn. In particular, given supplementary assumptions, these conclusions have been reached:

(I) The Leibnitz identity criterion is inadequate in intensional sentence contexts. What the r-opacity and paradox arguments show, quite directly, is that

6) $x = y \supset. \Box xf \supset \Box yf$

is invalid. Two theses emerge rather naturally. The first, which is reinforced by the feasibility of modal logics in which 6) is not valid, is that only substitutions based at least on strict identities, not substitutions based on extensional identities, are permissible in modal sentence contexts. The thesis generalised to intensional contexts is: extensional identities, such as 2), do not in general legitimate replacements within intensional sentence contexts. Furthermore, secondly, any resolution of the intensional paradoxes involves, in one way or another, qualification of the Leibnitz identity criterion. This is certainly the case, as we shall see, with all the solutions that have been proposed (and these represent pretty well every area of the solution space).

(II) The Leibnitz criterion is correct but cannot be applied unrestrictedly in r-opaque contexts like (3) because these contexts are impure, i.e. they contain quotation essentially. R-opaque sentences, which are really verbal, really about expressions, contain when expanded quoted expressions; e.g.

3) expands to

3') $9 > 7$ and '$9 > 7$' is analytic

and 1) expands similarly to 1'). Since 1'), 3') and 5) are mutually consistent, paradox is beaten. A Pyrrhic victory. For, first, given the standard theory of quotations, 6) is rejected under (II) as not universally valid: the correctness of (I) is thereby virtually admitted. Second, verbal interpretations qualify, as well as the Leibnitz criterion, several other logical principles, e.g. universal instantiation and existential and particular generalisation, and in general, block substitution within and quantification into

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(footnote [1] continued from previous page)
Note too that Quine cannot formalise these definitions in any language he considers admissible (the English he uses is not), for they involve either attribute quantification or quantification, in the metalanguage, over predicates.

The angle quotes represent the quotation function 'qu' of Goddard-Routley 66.

Contrary to popular misconception, which attributes the transparency notion to Quine, the notion goes back much further: it is deployed in PM, Appendix C.

r-opaque contexts. These heavy sacrifices - though insisted upon by Quine and others - are not at all satisfactorily substantiated and seem quite unwarranted reactions to the paradoxes. For the paradoxes can be alternatively resolved at much less logical cost, and the main logical principles in question can be independently vindicated. Third, given a non-standard but more plausible theory of quotation (e.g. that of Slog, 6) does hold under verbal interpretations but these interpretations then fail to eliminate modal paradoxes unless coupled with an approach like (I), (III) or (IV). Fourth, verbal interpretations of intensional functors have not been vindicated and remain open to extremely serious objections (beginning with the translation objections spelled out in Church 50).

(III) In order to retain the Leibniz criterion the class of singular subjects (individual expressions) which can replace subject (i.e. individual) variables is severely curtailed. This is undoubtedly the most popular referential approach. Consider the typical restriction, proposed in (B_i) above, where individual expressions are narrowed to merely referring expressions. The test for whether an expression is merely referring in a context is whether the scope of its associated description matters, that is affects truth-value, in that context: it is *merely referring* only if scope does not matter. The *associated description* of a name <m> is <the item which is m>, i.e. <$(\iota x)xm$>, and of a description is the description itself. If scope of the expression is not indifferent in its sentence context, so that the expression is not merely referring, the expression is replaced by its associated description and the description has in that context a sufficiently wide scope, that is a scope under which truth-value is unaffected by taking a wider scope if there is one. A sufficiently wide scope can always be found. In the setting of quantified modal logics with extensional identity (e.g. of the system = S5R* of EI), an expression is merely referring in a sentence context if it is referential in that context.

To illustrate the method consider the resulting solution of modal paradoxes. 3) is (replaced by)

3'') $[(\iota x)(x = 9).\ \Box((\iota x)(x = 9) > 7)$

i.e.: $(\exists z)((y)(y = 9 \equiv.\ y = z)\ \&\ \Box(z > 7))$. Using IIA and 2) there follows:

$(\exists z)((y)(y = \#p1 \equiv.\ y = z)\ \&\ (z > 7))$,

i.e.

4'') $[(\iota x)x\#p1].\ \Box((\iota x)x\#p1 > 7)$,

where '$(\iota x)x\#p1$' is the associated description of '#p1'. But 4'') (i.e. 4) according to (III)) is not inconsistent with

1'') $[(\iota x)x\#p1].\ \sim\Box((\iota x)x\#p1 > 7)$

i.e. with (the replacement of) 1). What amounts to this method, a method which is a straightforward variation of Russell's technique for dealing with names and descriptions which lack actual referents and which already fits within the framework of *Principia Mathematica*, is advocated by Smullyan (in 48)[1] and by Prior (in 63) and is taken for granted in much of the more recent work in the area, e.g. Kripke 71, Linsky 77.

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[1] Quine is entirely mistaken in his claim (FLP, p.154) that Smullyan undertook an *alteration* of Russell's logic of descriptions, and that Russell's theory did not allow differences of scope to affect truth-value where the description succeeded in naming (see PM *14, especially *14.3).

The Smullyan-Prior technique succeeds formally because it is parasitic on solution (I), because it replaces a modal sentence context where substitution of 'b' for 'a' using an extensional identity $a = b$ would go bad by an extensional substitution context. If 'a' is not modalised then in the relevant logics 'a' occurs in an extensional context. Then in general the scope of the associated description of a is indifferent - by

$$7): \quad (\exists! x)f(x) \supset. \ (p,q)(p \equiv q \supset. \ \Phi(p) \equiv \Phi(q)) \supset.$$
$$\Phi\{[(\iota x)xf] \,.\, ((\iota x)xf)h\} \equiv [(\iota x)xf] \,.\, \Phi[((\iota x)xf)h\},$$

a version of PM *14.3 - and 'b' can replace 'a' in virtue of the extensional identity criterion. If 'a' is modalised then either the scope of its associated description is indifferent or it is not. If the scope is indifferent, then a wider scope can be selected such that the relevant substitution position occurs in an extensional context. But it will not happen with the usual logical modalities (except for special combinations) that scope is indifferent. If the scope of the associated description is not immaterial then the expression substituted for is brought into an extensional context by an adaption of the usual method of replacing a non-extensional context by an extensional context (namely using identity and quantification, to replace xf by $(\exists y)(x = y \,\&\, yf)$). Thus substitution is not really made within a modal context. The Smullyan-Prior technique is tantamount to narrowing the class of individual names so that all but logically proper names need occur only in extensional contexts. Hence the technique conforms to solution (I). Indeed 4") follows at once from 3) and

$$2'') \quad 9 = (\iota x)x\#pl,$$

a relation obtained from 2) by replacing '#pl' by its associated description, using a derived rule of quantified modal logics (such as =S5R*), namely the rule:

$$B(y),\ y = (\iota x)A(x) \rightarrow B((\iota x)A(x)), \quad \text{where}$$

the scope of the description includes all modal (intensional) operators in B.

The Smullyan-Prior technique amounts to a modal application of the usual technique for replacing intensional contexts by equivalent extensional ones, together with a restriction on the interpretation of variables so that a variable can only go proxy for merely referring expressions or logically proper names. Other singular referring expressions are replaced under the interpretation by descriptions, the role of which is regulated by new scope conventions. To illustrate consider a generalisation of 3), $\Box(x > 7)$. To ensure that the variable ('x') on which replacement is made occurs in a non-modal context this is transformed into the classical logical equivalent: $(\exists z)(x = z \,\&\, \Box(z > 7))$. Since now replacement using an extensional identity such as $x = (\iota x)x\#pl$ is permissible it follows: $(\exists z)z = (\iota x)x\#pl \,\&\, \Box(z > 7))$ and therefore: $[(\iota x)x\#pl] \,.\, \Box((\iota x)x\#pl > 7)$, i.e. 4").

Although the Smullyan-Prior technique is as formally satisfactory as the theory of descriptions and other logical apparatus on which it depends,[1] that is not enough. Difficulties are simply transferred to the interpretation of the symbolism. For under interpretation it re-raises in acute form all the difficulties raised by Russell's sharp distinction between proper names and definite descriptions and by Russell's and Wittgenstein's theories of logically proper names, difficulties intensified, once the motley of intensional operators is admitted. For instance if 'Lesbia' and 'Clodia' were logically proper names not only $\Box$(Lesbia = Clodia) but worse $(x)K_x$(Lesbia = Clodia) would be true. It is a short route to the conclusion that there are in English no logically proper names and can be none: the variables have no English substitution values.

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[1] How very unsatisfactory the logical operator is is explained in §12

(IV) To guarantee the Leibniz principle the items to which individual expressions relate or refer and over which individual variables range, viz. individuals, are replaced by different items, e.g. individual concepts. Compare (B_{ii}) above. This procedure, pursued according to Quine[1] by Frege, Church and Carnap, though it might, after refinement, suffice for a theory of individual concepts, bypasses the main problems at hand, problems as to the criteria for the (contingent) identity of individuals. The procedure becomes practically unworkable when the full spectrum of intensional functors is introduced. (For reasons given in the criticism of theories in the Fregean mode, §7.) And as stressed by Quine, even when only modal functors are added the procedure is not, on its own, going to solve problems raised by identity relations and quantifiers in modal sentence contexts: for consider such contingent identities as $a = (\iota x)(p \& (x = a))$ where p is contingently true, and a is an intensional object, e.g. an individual concept. Then a and $(\iota x)(p \& (x = a))$ are no more interchangeable (preserving truth) in modal sentence contexts than 9 and #pl. Distinctions between various identity relations, or else distinctions between equalities or equivalences of various strengths (the course adopted by Carnap in explications of the issues), still have to be made. But if these distinctions are made, there is no need to limit or change ranges of variables. Because such distinctions are made and substitutions in intensional sentence contexts are restricted in what follows, variables are not there limited to intensional values or required simply (or even at all) to designate intensional objects (in some sense).

(V) The Leibniz criterion is correct: but certain laws of classical logic, in particular existential generalisation (EG) and universal instantiation (∀I), must be abandoned when non-extensional predicates or contexts are admitted; and, more generally, the binding of variables in modal contexts by quantifiers, since not significant, must be given up. This is the course advocated by Quine. Quantification into non-extensional sentence contexts is impermissible, i.e. variables occurring within such contexts cannot, legitimately or significantly, be bound by quantifiers occurring outside the context.

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[1] See Quine FLP, pp.152-4 for references and criticism. It is at least very dubious whether Carnap pursues the course attributed to him by Quine, whether Carnap's variables are limited to intensional values. Those formal techniques outlined in Meaning and Necessity, which are designed to divert modal paradoxes, and which are independent of the (inadequate) analysis of analyticity in terms of L-truth and ultimately in terms of state descriptions, are similar to some of those to be explained shortly. But not only do the interpretations differ markedly. Further, whereas the solution proposed in (1) specifically qualifies Leibnitz's criterion and applies directly to puzzles concerning identity, Carnap's "solution" is much less specific and direct: it requires "translation" of the paradoxes into the notation of his semantical systems. Also Carnap's exposition of some vital notions, e.g. of 'individual concept' or as it should be 'self-consistent individual concept' and of 'x is the same individual as y' in rule of truth 3-3, is insufficiently explicit. Very roughly, however, Carnap's "solution" is the formal mode analogue of the solution proposed in (I).

It is easy to plot out routes by which Quine arrives at his conclusions:

(i) His strictures on quantification and rejection of fully quantified modal logics would follow at once using the verbal interpretation explained in (II). And in exposition (e.g. in 53) Quine often reaches his position by carrying over results supposed to follow from the verbal interpretation to non-verbal construals of modalities. But not only is the verbal interpretation open to the criticisms levelled in (II); more important the extrapolation is not warranted.

(ii) Quine is forced - on pain of inconsistency - to abandon ∀I in modal contexts. For Quine maintains both that the Leibniz identity principle is correct for all contexts, not just for extensional contexts, and that modal contexts are referentially opaque; from which it follows that ∀I is false. Moreover the modal paradoxes can be blocked by abandoning ∀I (and the related EG). For in order to use 2), to make a replacement according to the classical Leibniz principle in 3) and so to get 4), ∀I is needed. Thus given that the full identity principle is secure and that ranges of variables are not to be tampered with, modal paradoxes can be re-employed as reductio arguments against adoption of ∀I and EG in modal contexts. Such reductio arguments are scarcely convincing on their own, especially when the assumed premisses are not at all well secured. There are more direct arguments to the failure of EG and ∀I in intensional contexts based on the Reference Theory; see, e.g. Linsky 77, p.117. The arguments typically depend upon construing the quantifiers in such a way that substitution of referential identicals is permissible in the specification of their values, but such referential imports, which are easily avoided, are just what is in question.

(iii) Quine does take more direct routes. His initial strategy then consists in showing that modal contexts are r-opaque. But the argument only shows that either 6) is invalid or that VI has to be qualified or... . It is important to emphasize that on its own demonstration of r-opacity of modal sentence contexts establishes nothing except this. It goes little distance towards establishing one of (II)-(IV). It does, however, point to a deficiency in some standard quantified modal logics with identity, where no provision is made for the symbolisation or treatment of contingent identities like 2); where provision is only made for strict identities like $3^2 \equiv 9$. Using such identities replacements can, of course, be made in 3) in virtue of the correct connection (a theorem of =S5R*), $x \equiv y \supset . \Box xf \supset \Box xf$. If, however, the unqualified Leibniz identity requirements from which these standard treatments begin are kept, all contingent identities vanish in quantified modal logics. A demonstration of this point amounts to a reductio ad absurdum of the full Leibniz requirement.

Quine's main direct arguments are designed to show that no variables within a modal context (or, more generally, no variables within an opaque construction) can be bound by an external operator or quantifier, that quantification into modal sentence contexts is not possible. There is, however, nothing to stop us particularising[1] on 3) to obtain the truth

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[1] In place of Quine's "intuitive" criterion (ii), in 47, the following principles, which accord with the theory of items, are used:

(i) A particular quantification is true if for some constant 'c' the substitution of 'c' for the variable of quantification would render the matrix statement true.
(ii) An existential quantification is true if for some constant, 'c', cE is true, and the substitution of 'c' for the variable of quantification would render the matrix statement true.

8) $(Px)\,\Box(x > 7)$

or to stop us from discussing the truth or falsity of

9) $(\exists x)\,\Box(x > 7)$.

So it is possible to do what Quine says it is not. But this is not what Quine meant. What his claims regarding quantification into modal sentence contexts reduce to can be put like this: sentences like 8) and 9) are senseless, improper, lack a clear interpretation; so assessment of their truth or falsity is ruled out (or else they are thrown into the false bag along with other nonsense). The fact is, however, that these sentences and their English renditions (e.g. in the case of 9) 'There exists an object which is necessarily greater than 7') are significant, are intelligible and understood by most students of logic, and have as clear an interpretation as some sentences of restricted predicate calculus. Furthermore Quine's arguments fail entirely to show that they are not significant. Quine's direct arguments to show that something or other is wrong with quantification into r-opaque contexts follow similar lines. They can be illustrated using example 8). Quine asks (to paraphrase FLP, p.148 and WO, p.147):

> What is this number which, according to 8), is necessarily greater than 7? According to 3) from which it is inferred, it is 9, that is the number of major planets. But to suppose that it is would conflict with the falsity of 4). In the sense of 'necessarily' in which 8) is true, 4) has to be reckoned true along with 3). Therefore with 8) we wind up either with nonsense or else with unintended sense.

Quine's argument is fallacious, given that extensional and strict identity can be distinguished.[1] Quine's argument rests on an equivocation on 'that is' (in later versions on an equivocation on 'i.e.') as between extensional and strict identity. For the number of planets is, in fact but not necessarily, nine. If the identity in question were strict then substitution in the instantiation of 8) would be admissible and would not lead to attribution of inconsistent truth-values to 4). But the identity 2) is not strict, so its truth does not conflict with the falsity of 4) unless the invalid

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[1] Intuitively the distinction between necessary identities and merely contingent identities is clear, and the distinction can be explicated formally. But it is bound to be questioned or rejected by extensionalists because the distinction makes use of modal notions. The dialectic thus leads to an examination of the pragmatico-empiricist indictment of modality, in particular the criticism of Quine (FLP, pp.20ff, especially), White 50, and others, of analyticity and necessity. Part of the criticism, that based in paradoxes of intensionality, is being unmasked in the text, but part is independent and relies upon an indictment of the notion of meaning, and of synonymy in particular. In part the latter criticism of analyticity depends on an elementary mistake, the mistaken equation of synonymy with logical equivalence, in terms of which an attack on meaning is transferred to an attack on the notion of analyticity; in part the criticism depends on a particular analysis of analyticity - according to which a statement is analytic when it is true by virtue of meanings - and is escaped simply by giving an account of necessity independent of meaning, as is done in MTD. But there is more to it than this: what has been demanded, in accord with the Reference Theory, is an extensionally-acceptable explication of an intensional notion, and this is of course impossible to supply. But it is no indictment of intensional notions such as necessity. (A fuller examination of the Quine-White against the analytic-synthetic distinction, and of intensional ways in which the distinction can be made out - is however a matter for another occasion.)

10) $x = y \supset. \Box f(x) \supset \Box f(y)$

(which is not a theorem of S5R*) is assumed. Using 10) Quine's reduction argument may be represented:

1) & 2) & 3) & 10) ; premisses

9) ; from 3) by EG, assuming 9E (i.e. by (ii) of a previous footnote)

$(\exists x)\ \Box(x > 7) \supset (\exists x)(\forall y)(x = y \supset \Box(y > 7))$; from 10) by classical quantification logic

$(\exists x)(\forall y)(x = y \supset. \Box(y > 7))$; ; using 9)

$(\forall y)(9 = y \supset. \Box(y > 7))$; since 9 is such a number

2) $\supset$ 4) ; by ∀I.

1) & 4), i.e. 4) & ~4).

Quine, exporting, concludes that ∀I and EG must be qualified, and somehow also concludes that 9) (got from 3) by EG) is not significant! At this stage there are serious and irreparable gaps in his argument; for instance his argument by no means establishes that 9) is not significant. For present purposes, however, these gaps may be disregarded: for as the argument uses the incorrect 10), it does not call into question 9), or the truth of 8), and it fails to impugn quantification into modal contexts.

Nor therefore does retention of 8) - or, if we are platonistically inclined, of 9) - force us to change or limit the (designation) range of individual variables, or to introduce a domain of individual items in which items if identical at all are strictly identical. Retention of 8), or 9), would only force these results given, what has been rejected, full indiscernibility.

For similar reasons, it does not follow - contrary to Quine's claim (47, p.47) - from the true premisses:

$(Px)(x = \#pl\ \&\ \Box(x = 9))$
$(Px)(x = \#pl\ \&\ {\sim}\Box(x = 9))$

that, because the matrices under the quantifiers yield contraries, there must be at least two items x such that

11) $x = \#pl$

is true. Such a conclusion would only follow given (what does not hold for extensional identity, but only for strict identity):

$(g(x)\ \&\ \Box f(x))\ \&\ (g(y)\ \&\ {\sim}\Box f(y)) \supset. x \neq y.$

The argument merely shows that there are at least two items which are not strictly identical such that 11) holds.[1]

Since $a = (\iota x)(p\ \&\ (x = y))$, but $a \not\equiv (\iota x)(p\ \&\ (x = y))$, when p is not necessary, whether or not a is an intensional object, the same moves (as above) can be repeated to block the objection (to adapt Quine FLP, pp.152-3) to including as values of variables intensional items such as individual concepts. Such objects can be values of variables; but to limit ranges of individual variables to such objects is quite unnecessary: such a limitation appears obligatory only within the context of a Double Reference Theory, only given the (misguided) attempt to reinstate full indiscernibility.

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[1] The use of neutral quantifiers in rebutting Quine's arguments against modality is, at every point hitherto, inessential. The points made hold even if ∀ and ∃ quantifiers are used and (designation) ranges of variables are limited to items which actually exist.

The equivocation that features in Quine's 'that is' argument is sometimes smuggled in by way of a neutral items shuffle. It is suggested to us that the morning star is identical with the (description) neutral item, Venus, and that the neutral item is identical with the evening star, and that identity is transitive. Then we are presented with an argument something like this: The morning star is necessarily the same as the morning star. The morning star is however identical with the neutral item (or the item itself, Venus). Thus the morning star is necessarily the same as the neutral item. And so on. The argument fails: for the identity of the morning star with the description neutral item, in this case the planet Venus, is contingent only, and not sufficient to warrant substitutivity in all modal contexts. The notion of a description neutral item is itself confused. Though items are to a large extent independent of descriptions, descriptions, since sensed expressions, are not modally neutral. 'The description neutral item' is yet another modally non-neutral description.

(iv) Perhaps Quine's main argument should be expanded in this rather different way: $\forall$I and EG are already suspect because of existence presuppositions. When modal functors are introduced the situation deteriorates further. Because of failure of substitutivity of contingent identities in modal contexts it is not clear which item(s), if any, the term generalised upon, in quantifying into modal contexts like (2), refers to; it is not even clear that the term specifies a definitely existing item. Until this obscurity is cleared up, we are not entitled to argue:

$$\frac{\Box(9 > 7)}{\therefore (\exists x)\ \Box(x > 7);}$$

any more than we are entitled to argue

$$\frac{\sim E(\text{Pegasus})}{\therefore (\exists x)\ \sim E(x).}$$

Certainly neither of these inferences is valid. But is the first inference any more problematic than:

$$\frac{9 > 7}{\therefore (\exists x)(x > 7)?}$$

Is the indefiniteness of reference of 8) any more worrying than the indefiniteness of reference of [(Px)(x > 7)]?

The failure of the first inference, like that of the third, is not a consequence of the failure of substitutivity of extensional identities in modal contexts, but of inadequate existential premisses. And the worry over indefiniteness stems at least partly from ensuing difficulties in guaranteeing existential premisses. Moreover quantification does not have to be independent of or neutral with regard to means of specifying substitutions for variables right up to contingent identities. Quine seems to suppose that it does; for he claims (FLP, p.152) that the crux of the trouble with

9) is that a number x may be uniquely determined by each of two conditions which are not strictly equivalent. But results from quantified modal logic with extensional identity (e.g. results 4, 5, 15, 16, A5 of §3 of EI) show clearly enough that introduction and elimination of quantifiers is not independent of whether constants are identified using extensional or strict identities, and hence is not independent of whether determining conditions are extensionally or strictly equivalent.

Doesn't all this indicate a departure from purely extensional quantification theory? Syntactically it does[1]; but such a departure is inevitable when quantification theory is extended to include non-extensional functors. Thus variables do not do a purely referential job: they go proxy for expressions with nonreferential uses. We are not thereby engulfed in Aristotelian-essentialism, an emendation Quine thinks needed to refloat quantified modal logic (FLP, pp.155-6; WO, p.199). By 'Aristotelian-essentialism' is here meant: that essentialism, attributed by Quine to Aristotle, under which (to give Quine's opaque formulation, FLP, p.155),

> an object of itself and by whatever name or none,
> must be seen as having some of its traits necessarily
> and others contingently, despite the fact that the
> latter traits follow just as analytically from some
> ways of specifying the object as the former traits
> do from other ways of specifying it.

The second (the 'despite') clause is essential because the first clause is almost trivially satisfied. Since $\Box(x = x)$, but $\sim\Box(p \,\&.\, x = x)$ where p is contingent, x has necessarily, however specified, the first property of self-identity and non-necessarily the property given by $(p \,\&...= x)$. That a quantified modal logic shows 'such favouritism among the traits of an object' (LP, 155) does nothing whatever to establish Aristotelian-essentialism. What is apparently required is that an object (a say) has, however described or not, some feature f necessarily and some feature g contingently though there are specifications, b say, of a such that b has g necessarily. In other words, there is a preferred frame of reference in terms of which the properties of the object a are divided absolutely - i.e. independently of how a is referred to or described, or whether it is - into necessary features and contingent features. Smullyan's technique, which Quine quite erroneously takes as the examplar of the sort of course that offers 'the only hope of sustaining quantified modal logic' (LP, p.154), does offer such a preferred frame of reference, with its 'fundamental division of names into proper names and (overt or covert) descriptions, such that proper names which name the same object are always synonymous'.[1] But such a fundamental division of subject terms is itself - like the assumption that successful quantified modal logic supposes a preferred frame of reference - a result of insistence on a full indiscernibility principle in the case of proper names (and thus ultimately on accepting the Reference Theory). For then, where c and d are proper names, if $c = d$ then $A(c)$ iff $A(d)$ for every (nonquotational) frame A. That is, c and d are interreplaceable preserving truth everywhere, and so, by the salva veritate test which is sufficient for synonymy, 'c' and 'd' are synonymous.

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[1] The extent to which it does depends on criteria adopted for a "purely extensional quantification theory". One (semantical) criterion suggested in Quine's work is that the values of variables need not be intensions. That the values of variables in quantified modal logic must be intensions is not established by the following invalid argument (effectively that used by Quine against Carnap in MN, pp.196-7):

> We have that $(x)(x \equiv x)$, i.e. every item (entity) is strictly identical to itself. This is the same as saying that items between which strict identity fails are distinct items - a clear indication that the values of variables are intensions, e.g. individual concepts rather than individuals.

For saying that every item is strictly identical with itself is not the same as saying that items between which strict identity fails are distinct items: they may in fact, be (extensionally) identical. $(x)(x = x)$ is also true.

On the semantical criterion highly intensional logics may be "purely extensional".

But abandon full indiscernibility, and therewith its Reference Theory supports, and the unwelcome features of doing quantified modal logic that Quine has adduced, and many others have uncritically accepted, fall away. Firstly, no fundamental division of names and descriptions is essential. Terms c and d, whether names or descriptions, can satisfy different modal conditions, e.g. though $c = c$ necessarily it may be only contingently true that $c = d$. So too the special case of indiscernibility in Barcan's logic, $x = y \supset \Box(x = y)$, which Quine takes as symptomatic of essentialist presuppositions in quantified modal logic, is not universally valid: such aspects of essentialism disappear. More important, the need for a preferred frame of reference is eliminated, the conditions for Aristotelean-essentialism are not met. The conditions are that if object a, named by proper name 'n', has some nonuniversal feature f necessarily and feature g contingently then it has these features absolutely and however else named, even though there are descriptions (descriptive ways of specifying) 'b' of a such that modalities are reversed, e.g. g holds analytically of b. The conditions for essentialism thus presuppose the already scrapped fundamental division of names and descriptions, and the assumption that they must be met depends once again on full indiscernibility (in modal contexts). For suppose 'c' is another name for a; then $c = a$ whence by full indiscernibility, $\Box cf$ and ∇cg. But let b be another name for a such that $b = a$ and $\sim\Box(b = a)$; for any a such a name or description b can be found, if only by devising a new abbreviated description 'b' for a. Then neither $\Box bf$ not ∇bg follow. Admission of contingent identity destroys Aristotelean-essentialism. Furthermore let 'd' be a description of a such that g follows necessarily from d (as envisaged in Quine's 'despite' clause): and let 'd'' be a name so introduced that 'd is strictly identical to d. Then as $d' \equiv d$, $\Box d'g$; so $\sim\nabla d'g$, i.e. 'd'' provides an appropriate name for b. And since $d' = a$ (though $d' \not\equiv a$), object a can be (extensionally) named without essential modal commitment; that is, d' is part of an alternative frame of reference carrying with it different modal properties. To sum up, 'the upshot' of Quine's reflections (LP, p.156) 'that the way to do quantified modal logic, if at all, is to accept Aristotelian essentialism', is only an upshot within a blinkered, and far from compulsory, viewpoint. When that main component of the Reference Theory, full indiscernibility, is removed, it can be seen that quantified modal logic can be done (and done unproblematically) without accepting 'a philosophy as unreasonable' as Aristotelean-essentialism. Aristotelean-Essentialism would result only if we were to revert to something like, what we have already rejected, a purely referential theory of identity and of the possession of properties or traits, to the effect e.g. that if a possesses properties g and $\Box h$ then b also possesses these properties if b = a. On the contrary, what properties and relations a has depends not merely on the reference of 'a', but also, and crucially in the case of nonextensional properties, on the full interpretation of 'a', on the nonreferential uses of 'a'.

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[1] That is, while proper names remain; for without modal ruthlessness, of the sort exhibited by Prior and more recently Kripke, which accepts essentialism, proper names vanish into unexemplified logical placeholders.

Quine's question (WO, p.199) designed to evoke bewilderment, as to modal properties of the cycling mathematician, c, only gets its point when we are not concerned purely with the referent of 'c'. Even then it is important to remove a familiar ambiguity, which Quine so works into the premisses as to increase the confusion. For the premisses could be represented (using obvious abbreviations, 'rat' for '(is) rational', 'twl' for '(is) two-legged') either:

1a. $(x)(\Box(\mathrm{math}(x) \supset \mathrm{rat}(x)) \;\&\; \sim\Box(\mathrm{math}(x) \supset \mathrm{twl}(x)))$

2a. $(x(\Box(\mathrm{cyc}(x) \supset \mathrm{twl}(x)) \;\&\; \sim\Box(\mathrm{cyc}(x) \supset \mathrm{rat}(x)))$

or:

1b. $(x)(\mathrm{math}(x) \supset.\ \Box\mathrm{rat}(x) \;\&\; \sim\Box\mathrm{twl}(x))$

2b. $(x)(\mathrm{cyc}(x) \supset.\ \Box\mathrm{twl}(x) \;\&\; \sim\Box\mathrm{rat}(x))$.

From the much more plausible a-premisses it follows, using: $\mathrm{math}(c) \;\&\; \mathrm{cyc}(c)$, that: $\mathrm{rat}(c) \;\&\; \mathrm{twl}(c) \;\&\; \sim\Box\mathrm{rat}(c) \;\&\; \sim\Box\mathrm{twl}(c)$. Hence: $\nabla\mathrm{rat}(c) \;\&\; \nabla\mathrm{twl}(c)$, i.e. c is contingently rational and contingently two-legged. It also follows that it is contingently true that c is rational and two-legged. These are (the) modal properties of the cycling mathematician c. But from the implausible b-premisses it follows classically that: $\sim\Diamond(\exists x)(\mathrm{math}(x) \;\&\; \mathrm{cyc}(x))$, i.e. it is impossible that there exists any thing that is both a mathematician and a cyclist.

The same modal fallacy principle, $\Box(p \supset q) \supset.\ p \supset \Box q$, which leads from a-premisses to b-premisses is needed to get from the correct (and demonstrable)

(12) $(w)(f(w) \equiv.\ w = x) \;\&\; (w)(g(w) \equiv.\ w = x) \supset.\ \Box(w)(f(w) \equiv g(w))$

to

(13) $(x)(f(w) \equiv.\ w = x) \;\&\; (w)(g(w) \equiv.\ w = x) \supset.\ \Box(w)(f(w) = g(w))$,

the disastrous assumption (effectively assumption [4], WO, p.198) Quine considers needed in order to interpret fully quantified modal logic, because necessary to legitimate quantification into modal positions. But (13) is invalid, as counterexamples readily show; e.g. take 'f' to be 'is Venus' and 'g' 'is the morning star'. Also (13) is demonstrably not a theorem of more satisfactory quantified modal logics with extensional identity (e.g. system =S5R* of EI): since $[p \supset \Box p]$, which (13) implies, is rejected, so is (13). Why the modal-flattening assumption (13), as opposed to (12), is supposed to be needed for interpreting quantified modal logics is not made clear. In fact it has what plausibility it has only in the context of essentialism. If earlier arguments are cogent extensionalizing assumption (13) is very definitely an undesirable and in no way required for quantified modal logic.

What are the appropriate qualifications on full indiscernibility? Intensional paradoxes arise by intersubstituting ordinary factual identicals within intensional frames, and are blocked by blocking such replacements. Moreover all such replacements should be blocked. For factual identities are identities in fact, identities true for the real world T but not necessarily beyond, whereas the semantical assessment of genuinely intensional functors always involves going beyond T to what is the case in other worlds. The factual identity $x = y$, interpreted as $I(x, T) = I(y, T)$, no more legitimates the replacement of $I(x, a)$ by $I(y, a)$, i.e. the interpretation of x at arbitrary world a by the interpretation of y at world a, than the coincidence, or temporal identity, of x and y at time T legitimates the identification of x and y at time a later than T. The appropriate qualification on Leibnitz's Law is then to indiscernibility in extensional frames, to extensional indiscernibility.[1]

Thus the correct logic of (ordinary, factual) identity to add to neutral quantification logic is given by the following schemes:-

$x = x$ (reflexivity of objects)

$x = y \supset. A \supset B$, where B is obtained from A

by replacing an occurrence (and hence, zero or more occurrences) of subject term x by term y, provided the occurrence of x is not within the scope of quantifiers or operators binding x or y or within the scope of an intensional operator (extensional indiscernibility). Strict identity, $\equiv$, is defined in terms of identity is thus a matter of coincidence of features in all the worlds of modal logic - not all worlds, but only the complete possible worlds modal logics consider. The logics and semantics of ordinary, strict, and other identity relations are given and unified in EI, and some of the details will be set out in subsequent sections. Whatever the objections to extensional identity - the objections invariably flow from the Reference Theory or some elaboration thereof - the logical theory at least establishes its viability and coherence, thereby refuting such overstatements as Linsky's (77, p.116), that 'one cannot coherently think that numerical identity does not entail the qualitative sort', that IIA fails to hold. But surely there is a place for Leibnitz identity among identity criteria; after all it can simply be defined in terms of full indiscernibility? Yes, there is a place, a very limited place, with a role of importance only in rather impoverished languages. And in richer languages, which include quotational devices, Leibnitz identity will either vanish into type identity of symbols, or quotational functors will have to be separated (somehow, even where quotation is implicit) from non-quotational ones, and Leibnitz identity will come to mean a qualification (like that to extensional frames for extensional identity) to nonquotational frames, and so its appearance of absoluteness will vanish.

The dethronement of full indiscernibility removes another part of the case for the hierarchical segregation of languages into object language-metalanguage-metametalanguage, etc., that classical logic has tried to impose.[2] A part of the reason for the prevailing fetish for keeping mention, as distinct from use, out of the object language is that if it were permitted the splendid simplicity of Leibnitz's law would be lost. The simplicity is a falsifying simplicity and it's past time it went.

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[1] An alternative, but fuller, account of the qualifications on identity replacement, and of the important connected problem of characterising extensionality, may be found in Slog, chapter 7.

[2] The main case for the hierarchy is always said to be the semantical paradoxes. But that case does not bear much examination: see Goddard-Routley 66 and UL.

To set things in perspective:- Three main approaches to the interwoven questions of identity and quantification in intensional sentence frames have been distinguished; namely nonreductionist theories, theories in the Russellian mode, and theories in the Fregean mode. Nonreductionist (noneist) theories qualify full indiscernibility and can accordingly treat quantification into intensional frames as in order as it is without reductive analysis, without reduction to some alternative logical form. In contrast, reductionist theories (accepting the assumptions of Reference Theory) insist upon full indiscernibility and accordingly have to either reject, or else offer a reductive analysis of much quantified intensional discourse. The case for the rejection of such discourse, the case presented most forcefully by Quine, has been found wanting. In fact the case fails not only, as demonstrated, from a nonreductionist viewpoint, but also, at least in the case of modal logic, from a reductionist viewpoint, provided some fundamental distinctions, such as that between proper names and descriptions, are adhered to, and essentialism, what is sometimes called a 'moderate' essentialism, is accepted. Linsky for example, roughs out a case for the claim that

> ... Quine's difficulties in interpreting modal logic ... could have been avoided by scrupulous attention to the distinction between proper names and definite descriptions together with the scope distinctions attendent upon the latter. ... Those of his arguments turning on singular terms turn out to be scope fallacies since they all involve definite descriptions (77, p.125 and p.142).

Linsky's case breaks down, however, for discourse more highly intensional than modal: he has no analysis for instance, for epistemic sentence contexts or for the behaviour of subject terms and variables within the scope of such functors as 'a wishes to know whether' (see, e.g. 77, pp.63-6). Likewise most of the rest of Linsky's theory[1] either fails for, or admits of no obvious or easy extension to more highly intensional discourse than modal. That is, the proposals work at best for a very circumscribed class of intensional contexts, and break down where the required broader viewpoint is taken, when compartmentalisation is abandoned. For example, while the results of Leibnitzian devastation in the modal case, e.g. that all identities are when true necessarily true (accepted by Linsky, p.142), do not perhaps pass toleration level, the results in such cases as the epistemic (deontic, assertoric, etc.) do become intolerable, e.g. epistemically it has to be required that all true identities are known to all knowers! The theory of proper names as rigid designators is in similar trouble.

Reductive theories divide (as already explained in the separation of (B_i) from (B_{ii})) into theories in the Russellian mode - theories which depend on a basic distinction between proper names, which conform to the Reference Theory and descriptions, which are eliminated, in one way or an other under analysis, the way depending on their scope - and theories in the Fregean mode, Multiple Reference Theories which replace the ordinary objects of reference in oblique contexts by new objects, such as concepts or objects qua mode of presentation.

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[1] In 77, principally a smooth combination of the Smullyan-Prior technique with material on proper names and rigid designators drawn from Kripke.

The noneist thesis is that none of these reductive theories succeed, or can succeed, without disturbing or scrapping some of the data that has to be taken into account, namely some of the true intensional statements that are or can be made. There are several arguments for the thesis some of which (e.g. the arguments against theories in the Fregean mode) have been presented but many of which (e.g. the case against various attempts to draw, and deploy, sharp distinctions between proper names and descriptions) have yet to come. A main line of argument for the thesis is this:- Both styles of reductive theory depend upon an adequate theory of descriptions, theories in the Russellian mode critically as the Smullyan-Prior technique makes plain, and theories in the Fregean mode because true statements, especially intensional statements, are often apparently about objects which do not exist. But there is no adequate reductive theory of descriptions, i.e. no theory of descriptions which succeeds, preserving truth, in eliminating descriptions from all contexts of occurrence.

The matter of descriptions is, in any case, extremely important. For it is on the eliminability of descriptions that the referential case against theories of objects turns. Russell's criticism of Meinong, repeated with variations ever since and often hailed as one of the triumphs of modern philosophy, was that discourse apparently about what did not exist could always be replaced satisfactorily by (referential) discourse about what did exist, the replacement proceeding by the elimination of nondenoting names in favour of descriptions, followed by the elimination of descriptions (in favour of quantified phrases carrying existential loading). On empiricist theories in the Russellian mode, as contrasted with conceptualist and platonistic theories in the Fregean mode, the adequacy of the theory of descriptions assumes a double importance; for description theory has a critical role in accounting, not only for nonexistential discourse, but for intensional discourse, since on strict empiricist principles such things as concepts do not exist and so cannot be referred to in reductive analysis. As has already been glimpsed in §4 however, classical theories of descriptions are inadequate. Once this is shown in detail, the classical referential edifice falls.

§12. *Russell's theories of descriptions and proper names, and the acclaimed elimination of discourse about what does not exist.* Classical logic of course provides methods for treating discourse purportedly about nonentities. The most important - and adequate, inasmuch as it attempts to take account of intensional sentence frames - of these devices is Russell's theory of descriptions. Many of the projects that a theory of items would accomplish, and all the essential ones, Russell thought he could fulfil within a classical framework through his theory of descriptions. And Russell's theory of definite descriptions does extend the Reference Theory to a point where nonentities can (so to speak) be asserted not to exist and ascribed (in a secondary way) intensional properties. But the theory manages to retain the Ontological Assumption, that only that which exists has true properties, through the assumption that true assertions apparently ascribing properties to nonentities are systematically misleading and not really about nonentities and do not ascribe (primary) properties to them; the surface grammar of such assertions is misleading as to their proper logical form.

Thus Russell would - on the basis of his own theory of descriptions and associated doctrines concerning individuals and proper names - reject assumptions on which the argument so far has relied: that 'Pegasus', 'Primecharlie', 'Zoroaster' and such like are genuine subjects; that the items so-named and nonentities, can be values of (subject) variables; and that descriptions are "complete" symbols. The rejection of these assumptions and the adoption of a contextual theory of descriptions like Russell's are related strategies, and Russell naturally develops his case for both at once. But Russell's case is by no means watertight: there are many reasons for rejecting Russell's theses about proper names and descriptions.

The reasons yield in turn reasons for rejecting alternative theories of proper names and descriptions set within the referential framework. But in what follows the emphasis is on Russell's theory of names and descriptions since it is far and away the best articulated and defended of classical theories for coping with nonreferential discourse: while more modern theories of proper names may, at first sight, appear to improve upon Russell's theory, the appearance is not so easily sustained, and other theories of descriptions generally fare even worse than Russell's.

Firstly, Russell's analysis simply assigns all such statements where nonentities have a primary occurrence the value false, with the unacceptable consequences that all such statements are uniformly rejected ('Pegasus is identical with Pegasus' is taken to be just as false as 'Pegasus is identical with Cerberus' or the indeterminate 'Pegasus weighs two tons'), and that nonentities are indistinguishable one from the other. Secondly, it is very doubtful that Russell's theory of definite descriptions works even in cases it was initially presented as resolving, e.g. in the first of the three puzzles Russell presented (in OD, pp.47-8) for any theory of denoting it is assumed in Russell's solution that the statement "George IV wished to know whether Scott was the author of Waverley" can be analysed preserving meaning by elimination of the description 'the author of Waverley' as a secondary occurrence in accordance with his theory, but it is dubious whether truth even is preserved under such an analysis.[1] Much more important, the theory yields intuitively incorrect truth-value assignments in very many intensional cases (indeed in all of the three classes of cases already considered, p.34ff). For example, indefinitely many counterexamples to the theory like the following can be devised:

7) Meinong believed that the round square is round;

7') R supposes Pegasus is winged;

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[1] Linsky argues (67, p.71ff.) that the analysandum may be true though the analysis (namely "George IV wished to know whether one and only one entity both wrote Waverley and was identical with Scott") is false - because George IV did not want to know whether one and only one entity wrote Waverley, already knowing this - thereby confirming the truth of

13) Linsky argued that it might have been the case that George IV wanted to know whether Scott was the author of Waverley, though George IV did not want to know whether one and only one entity both wrote Waverley and was identical with Scott.

Linsky then argues, rather convincingly, that none of many possible analyses of 13) that Russell's theory supplies is logically equivalent to 13). If so, Russell's theory succumbs to intensional counterexamples where existence is not an issue.

Rescher thinks that the present king of France is a king; Free logicians contend that Pegasus = Pegasus; Zimmerman's dictionary of classical mythology asserts the Cerberus has three heads; I dreamt that I owned the non-existent Pegasus; It is possible that the universe (the domain of entities) has exactly one other individual added to it; etc. etc.

Consider (7). Russell does not offer a single analysis of (7), but rather a choice between two analyses, namely (using standard notation and obvious abbreviations):

(i) $B_M[(\iota x)(r(x) \,\&\, sq(x))]\, r((\iota x)(r(x) \,\&\, sq(x)))$,
i.e. $B_M(\exists x)\{r(x) \,\&\, sq(x) \,\&\, (y)(r(y) \,\&\, sq(y) \supset .\, y = x) \,\&\, r(x)\}$,
i.e. $B_M(\exists ! x)(r(x) \,\&\, sq(x))$; and

(ii) $[(\iota x)(r(x) \,\&\, sq(x))]\, B_M r((\iota x)(r(x) \,\&\, sq(x)))$, i.e.
$(\exists x)\{r(x) \,\&\, sq(x) \,\&\, (y)(r(y) \,\&\, sq(y) \supset .\, y = x) \,\&\, B_M r(x)\}$.

Both (i) and (ii) fail as analyses of (7). For (7) is true; Meinong did believe, however perversely, that the round square is round. But (i) is false because Meinong did not believe that the round square exists, and (ii) is false because a round square does not exist. As neither proposed analysis has the same truth-value as (7) itself, Russell's theory is incorrect.

The orthodox rival theories of definite, description those presented by Frege and by Hilbert-Bernays, fare no better. Under Frege's theory, also adopted in essentials by Carnap and Quine, (7) is supposed to be equivalent to, what is almost certainly false, "Meinong believed that the null set is round"! On Hilbert-Bernay's theory, (7) cannot even be expressed; indeed "a does not exist", where true, is inexpressible on this theory!

It could be objected that (7) is not a genuine example of a sentence containing a definite description, as 'the round square' is a universal term like 'the Triangle'. But firstly, 'the round square' can serve as a definite description (it has the same dual role as 'the horse') and secondly, the example is easily varied with no reduction in damage, e.g. consider 'the round square that was Meinong's favourite'. Or consider (7'), which was also selected to bring out another key stage in the reductive analysis. (7'), it is true, contains no description, but all nonreferring names are treated in Russell's theory as disguised descriptions; so it contains a disguised description and a first step in analysis is to make that description explicit. Thus Pegasus is replaced by some description with the same force, e.g. 'the winged horse which...'. As it is pretty unclear which description will serve, let us use Quine's formal expedient, introduce a predicate 'pegasises' and replace 'Pegasus' by 'the entity which pegasises', $\iota x p(x)$ for short. Then (7') is said to be logically tantamount to

7") R supposes $\iota x p(x)$ is winged.

And now the same problems as with (7) arise; for it is or may be false both that R supposes there exists a unique object which is winged ... and also that there exists a unique object which R supposes to be winged.

Russell's theory of indefinite descriptions fails in a similar way for many intensional cases. According to this theory (see MP, 18) the sentence 'an entity which is ϕ is ψ' is logically equivalent to 'Some ϕs are ψs, i.e. with $(\exists x)(\phi x \,\&\, \psi x)$). But counterexamples to the analysis can be constructed from examples like: R supposes that a particular winged horse (Pegasus) is winged; It is logically necessary that a perfect diamond is perfect; It is commonly acknowledged that a king of France is a king.

Furthermore, though this is a much more controversial claim (the data having been rendered soft by referential theories), Russell's theories bring out the intuitively wrong assignments in many extensional contexts as well. For example, the theories assign value false to the apparent truths: Pegasus = Pegasus; a (particular, arbitrary) unicorn is equine; Pegasus is a winged horse; a mythical king is still a king; God is wise; an (the) ideal gas satisfies Boyle's law.

Another deficiency of Russell's theories of definite and indefinite descriptions, which the counterexamples point up, is the matter of scope artifices: their occurrence, their ad hoc character and their multiplicity (just consider the scope ambiguity of $B_M(7)$), and the fact that there is no effective indication as to which scope is to be taken. Though Russell's theory, unlike ruder theories of descriptions, uses scope ambiguities to great advantage and often manages to escape total disaster by appeal to scope artifices, the theory offers no guide as to which analysis is correct or when a particular analysis is correct. Scope devices are not a satisfactory way, because so ineffective, nor as the counterexamples show an adequate way, of coping with lack of existential import in intensional contexts.

A related deficiency of each theory is that it does not offer a single uniform definition to cover all contexts. The theory has to make exceptions for the ontic predicate 'exists', and really for its many compoundings (e.g. 'perishes' 'creates'); and it does not cater at all for other status predicates such as 'is possible', but if it were to it would have to make further exceptions. More importantly, the theory has to recognise ontic (or status) predicates as a separable class of predicates, and it has to require that the intensional elements in predicates can be isolated into connectives so that scoping artifices can apply. In short, despite initial appearances, the theory has to recognise a certain classification of predicates, and to presuppose a range of sometimes ad hoc extralogical analyses of natural language sentences which bring the sentences into proper logical form for the theories to apply.

There is sometimes little reason to accept these preliminary analyses. There are, for example; no compelling reasons for accepting Russell's theory of proper names and Russell's restriction of ranges of variables to entities, or for accepting Russell's thesis that descriptions are incomplete symbols either in the sense that they do not have a sense or reference in isolation or in the sense that they are not values of variables, or in the sense that they are not constituents of correctly analysed declarative sentences. Russell's arguments designed to show that descriptions are incomplete symbols, for instance, are invalid once separated from a narrow and implausible reference theory of meaning. Let us consider Russell's arguments[1] in detail.

Russell has to rely throughout - else his theory fails to deliver the promised results - on a sharp and absolute distinction between (logically) proper names and descriptions, a distinction (not recognised in natural languages which allow a fairly free interchange of names and associated descriptions) which has the consequence that such apparently satisfactory names as 'Pegasus', 'Romulus' and 'Churchill' are classed as disguised descriptions. In fact the requirements on logical proper names are so severe that not only do no ordinary proper names, nor anything much in ordinary speech, qualify, as Russell admits:[1] they are so severe that no language could qualify; no names are logically proper. A logically proper name, according to Russell, (e.g. MP, p.20) is (a') one used to designate an entity of which the speaker is directly aware when speaking, and (b') it designates what it does without saying or implying anything about it. So, in particular, where 'a' is a logical proper name, neither 'a exists' nor 'a does not exist' are significant (PM, pp.174-5; PLA p.201); for were 'a exists' true, something would be implied about a contradicting clause (b). Yet for clause (a') to be satisfied a must exist. The requirements imposed on logical proper names are inconsistent. Yet the requirements cannot readily be weakened (see the arguments of PLA, and of Wittgenstein 47). Moreover each requirement (a') and (b') separately leads to trouble. Consider (b'); it

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[1] See, especially, PM, pp.66-7, OD, MP, PLA.

> seems to be an impossible requirement. For designation is essentially the selection of something for attention by means of a sign, and a sign which is to serve this purpose must have some implication, though this need be no more than the notion that there is someting which it designates for a certain group of persons. (Kneale[2] 62, p.598)

Yet (b'), or something like it, is unavoidable if Leibnitz's law is to be retained. For let 'c' and 'd' be two logically proper names for the one entity such that use of 'c' to designate the entity c says or implies that c has property f but use of 'd', perhaps does not. Then it is possible that someone's intensional attitudes discern c from d (even if mistakenly), thus furnishing functors which counter full indiscernibility (of c and d), and so Leibnitz's law. Briefly, logically proper names can carry no content, in particular no descriptive content, if they are not to foul up full indiscernibility.[2] The epistemological requirement (a') on its own (which could be satisfied by names of a curious cast) is insufficient to uphold Leibnitz's Law. But when supplemented (a') leads also to trouble: not only does it exclude names of anything but what presently exists and is perceived by the speaker, but really it precludes the repeated use of names over time, with the end result that names are sacrificed altogether and only grunts and the like remain.[3]

As it appears impossible, then, to attach the predicate 'is a logically proper name' correctly to any name, Russell's own arguments (PLA 241, 256) against distinctions without contrasts, may suggest that the distinction is otiose. On the contrary, this vacuous contrast is of the utmost importance in retaining classical logical theory as the theory which supplies the logic in contexts of philosophical interest such as epistemology and philosophy of language; without the contrast full indiscernibility is constantly in difficulties. The outcome of such a retention is curious and bizarre. Individual variables being placeholders for logically proper names hold places classically for nothing. Thus classical logic strictly has no direct application to ordinary intensional discourse. It is an "ideal" limit into which such discourse is to be translated - if it can. Leibnitz's Law is satisfied at this (unapproachable) limit. However it is already vacuously satisfied: we can all agree that it holds under replacement of variables for logically proper names, and that no time need be wasted upon searching for counterexamples. A corollary is that the popular procedure in quantified modal logic (pioneered by Marcus) of combining the Smullyan-Prior technique with a substitution interpretation of quantification fails when extended beyond the narrow intensional confines of modality. For when so extended, proper names disappear, and therewith all requisite substitution instances.

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[1] The demonstratives 'this' and 'that' used with reference to sense-data are cited as examples of terms in everyday discourse approximating to logically proper names.

[2] Given, that is, that rather drastic alternatives are ruled out, such as that there is really only one property, so that if a thing has a property at all it has The Property. In case this seems to be silly to record, recall classical logic with its One True Proposition and One False Proposition.

[3] Details of the argument are to be found in Wisdom 52, chapter 7. See also the telling criticism of logically proper names made by Wittgenstein 51.

The proper names/descriptions distinction would hardly matter so much were it not that Russell proceeds - as he is bound to proceed given classical logic - to exclude all descriptions as genuine subjects and as (replacement) values of variables. Russell thinks that only certain names may be substituted for free variables, and that fallacies occur when descriptions are substituted for variables. For instance, he claims (MP, 21) that we commit a fallacy if we attempt to infer from x = x, without further premisses, that the author of Waverley is the author of Waverley. Russell argues:

> If "x" is a name, "x = x" is not the same proposition as "the author of Waverley is the author of Waverley". no matter what name "x" may be. Thus from the fact that all propositions of the form "x = x" are true we cannot infer, without more ado, that the author of Waverley is the author of Waverley.

But why should subject variables be restricted to name variables? Russell has conceded himself the point at stake by restricting his variables to purely name variables. It would appear, however, that we can extend the range of variables so that descriptions as well as names may be substituted for variables: then we can infer, as we should certainly hope, a = a, where 'a' is a description, from x = x without further ado.

Russell has what he regards as crushing objections to widening the scope of variables, to admitting descriptions as values of variables (PM, 67; MP, 20; PLA 245). The objections are not crushing; for Russell conflates arguments for these distinct points:

(a) descriptions are not proper names, and

(b) descriptions are incomplete symbols and so not values of variables.

While some of Russell's arguments for (a) do carry weight - for instance the point that whereas the "meanings" of descriptions are determined by the meanings of the separate symbols of which they are composed, the "meanings" of proper names (commonly) are not - these arguments do not support (b). Nor do Russell's arguments render the distinction necessary, in the way he thinks. He argues:

> you may turn a true proposition [namely "George IV wished to know whether Scott was the author of Waverley, but he did not wish to know whether Scott was Scott"] into a false one by substituting "Scott" for "the author of Waverley" This shows that it is necessary to distinguish between a name and a description (59, p.84)

On its own, without names being contracted to logical proper ones it does not show this at all. For precisely the same points (regarding opacity) can be made in cases where two ordinary names, or two designations, are involved in place of "Scott" and 'the author of *Waverley*'. Consider, e.g. 'B wished to know whether Paterson's Curse is the same as Salvation Jane, but ...'.

Although descriptions do differ from proper names in various respects (thus while descriptions clearly have a sense whether proper names have a sense is a conflict issue), close formal connections bind descriptions and proper names. For every definite description a logically identical proper name can be introduced; and for every proper name a logically identical definite description can be introduced in these ways (with 'ι' read, neutrally, 'the'): $a = (\iota x)(x = a)$; $a = (\iota x)x$ a-izes (Quine's device); $a = (\iota x)(x$ is correctly called qu(a)). In contrast, usual reductions of names like 'Romulus' and 'Aristotle' to translated descriptions are inadequate, because they rest only on contingent identities and so do not guarantee the transfer even of modal properties. For this reason the following suggested replacements fail: 'Romulus' by 'the person called "Romulus"' (*PLA*, 243); 'Aristotle' by 'the philosopher born at Stagira who ...' (Frege); 'Homer' by 'the author of *Iliad* and the *Odyssey*' (*MP*, 23). For instance, it is not logically necessary that Aristotle was born at Stagyra.

More generally, there are no natural language descriptions - as distinct from formally devisable ones, with natural language renditions, which permit replacement in modal frames - through which proper names can be regularly eliminated, in a way which preserves requisite modal properties. And when the full range of intensional properties is taken into due account ordinary proper names have, in general, no descriptive replacements, whether by a single description or, as in Searle (58, and 68), by a set of associated descriptions. Ordinary proper names are not concealed descriptions, and not somehow contextually reducible to such (the issues of proper names are taken up again in a subsequent section).

To come to (b), which is fundamental. Granted that a description like 'the author of *Waverley*' is not a proper name, still why not abbreviate, or replace, the description of a proper name such as 'Autwav' or, say, 'c'? For this reason Russell argues (PM, p.67): If 'the author of *Waverley*' were abbreviated by a name 'c' then

8) Scott is the author of *Waverley*

would be synonymous with

9) Scott is c

Russell claims, rightly enough, that if c is anyone except Scott then (9) expresses a false proposition. But he also claims, unconvincingly, that if c *is* Scott then (9) expresses the same proposition as

10) Scott is Scott

which is a trivial proposition and plainly different from (8). For in the sense of 'proposition' in which (10) is the *same* proposition as (9), triviality does not transfer from (10) to (9), and (10) though the same proposition as (9) differs in respect of triviality.

Two senses of 'proposition', frequently confused, should be distinguished. In the stronger sense, p and q express the *same proposition* if and only if, for every (nonquotational predicate) Φ, $\Phi(p) \equiv \Phi(q)$. In the weaker sense, p and q express the same proposition, or the *same statement* (as will be said, to keep the notions distinct), if in addition one is obtained from the other by substitution of identicals. 'Proposition' and 'statement' may be defined from these sameness relations by abstraction.[1] Leibnitz's Lie demolishes the distinctions; for according to it identities are always intersubstitutible in every nonquotational frame; and hence statement identity merges with propositional identity. Thus many of Russell's arguments, which are correctly rejected as invalid, may be reinstated given Leibnitz's Lie as a further premiss.

Now (10) makes the same statement as (9) if Scott is c; but (10) does not express the same proposition as (9) or (8). For such nonquotational predicates as 'It is logically necessary that', 'J does not believe that' and 'George IV wished to know whether' do not transfer from (10) to (8) or to (9) preserving truth-value. Thus (10) is plainly different from (8), at least because (10) and (8) express different propositions. Furthermore the sameness-of-statement relation does not preserve triviality and informativeness. The very example under discussion illustrates this point; for (8) is informative though (10) is not, yet (8) and (10) make the same statement. It is now clear that Russell's argument does not establish the desired conclusion (b). For though (10) is trivial and analytic, and does make the same statement as (8), (8) is neither trivial nor analytic.

In Russell's generalisation of the argument (*PM*, p.67), the immediate issue is not whether '$\iota x \phi x$' is a proper name, but whether it has a meaning in isolation and so can behave in *logical* respects like a proper name, for example by being a value of subject variables. The chief issues, all fused together as concerning the completeness of descriptions are:- Does '$\iota x \phi x$' have a meaning in isolation? Can it be defined in isolation, non-contextually? Does it vanish from all its contexts under correct analysis of these? Can it be the value of variables? Russell's generalisation is designed to secure *his* answers on all these issues, and in particular the point that '$\iota x \phi x$' is not a value of variables. He argues

11) $a = (\iota x)\phi x$

is true or false but never merely trivial like

12) $a = a$.

But if '(ιx) x' were a value of a variable, (like) a proper name, (11) would be either false or trivial. For if (11) is true, then, by substitution of (11) in itself, (11) would express the same proposition as the trivial proposition expressed by (12). This argument is fallacious. For if (11) is true then it makes the same statement as (12), by substitution: but it does not express the same proposition because modal and intensional properties do not transfer preserving truth across the identity. Furthermore the proposition expressed by (11) is not trivial in the way that the *different* proposition expressed by (12) is. Consequently Russell's generalisation, an early version of the paradox of analysis, fails to show that '$(\iota x)\phi x$' cannot be a value of individual variables. Thereby Russell's next point, that "since y [or a] may be anything ... $(\iota x)\phi x$ is nothing", designed to show that '$(\iota x)\phi x$' does not have a meaning in isolation, is also destroyed: for once the main argument is undercut what is there to stop $(\iota x)\phi x$ from being a, which is not nothing (no item)? The x which Russellizes is Russell, who is not a nonentity.

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[1] The notion of proposition defined is a strict one. Less strict notions that appear to have philosophical applications may be defined by further circumscribing the class of predicates Φ which transfer salva veritate. Details of such definitions, and of the theory of statements and propositions may be found in V. and R. Routley, 'Synonymy and propositional identity', unpublished.

Russell attacks the suggestion that 'Scott' and 'the author of *Waverley*' are two names for the same object (*PM*, 67). However, his argument depends on some very special assumptions about names, which while they may apply to logically proper names, do not apply to proper names generally. Even if 'the author of *Waverley*' is counted as a name, it does not thereupon follow that it is a necessary condition for the truth of (8) that Scott be *called* 'the author of *Waverley*'. For names need not be used. Russell (*PM*, p.67) has conflated (8) with

8') Scott is called 'the author of Waverley'

as his arguments reveal. But someone who claims that (8) is equivalent to the statement that 'Scott' and 'the author of *Waverley*' are two names for the same object, that is to the statement "'Scott' and 'the author of *Waverley*' designate the same object", is not asserting (8'), and is not asserting a statement about names in the sense that (8') is "about names". Once again, Russell's argument does not show that 'the author of *Waverley*' cannot be treated logically like a name.

Elsewhere (MP, pp.20-21; PLA, p.246) Russell contrasts (8) with

13) Scott is Sir Walter

He claims that when names are used directly, are, used as names and not as descriptions like 'the person named 'Sir Walter' then (13) is the same trivial proposition as (10). This is not so. (13) is the same statement as both (9) and (10), but it is not the same proposition as either (8) or (10). In fact as someone may ask whether Scott is Sir Walter, expecting information, (13) is not completely trivial like (10). These points are better elucidated through examples, analogous to (13), like 'Cicero is Tully' and 'Hephaestus is Vulcan'. The trouble is, of course, that none of these names, indeed no ordinary names, resemble logically proper names in their main features, for instance in being purely referring and only significantly used if the denotation is ostensively indicable. Common or garden names, like descriptions, do not have the requisite features.

Indeed - though this point is not essential to the case against Russell - the notion of a logically proper name here required appears inconsistent.[1] If 'Cicero_L' and 'Tully_L' say, are logically proper names, then, since they are *purely* referring they should be interchangeable in all nonquotational contexts preserving propositions. Therefore since "Cicero is Cicero" is necessary,

14) $\Box(\text{Cicero}_L = \text{Tully}_L)$

follows.[2] On the other hand, that 'Cicero_L' is a logically proper name of

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[1] The argument which follows is different from those used against logically proper names earlier in the section.

[2] Russell asserts roundly that (13) is a tautology: PLA, p.246. Both Smullyan and Prior, developing Russell's theory, affirm propositions like (14): see IE. The thesis that all true identity statements are necessary is a commonplace of modal theories in the Russellian mode, e.g. Kripke 72, Linsky 77.

Cicero implies, or presupposes, that Cicero exists. Similarly that Cicero_L is identical with Tully_L implies or presupposes, that Cicero exists. There is a built-in proviso on the very occurrence of logically proper names that the items named exist: logically proper names, like Hilbert's descriptions, may only be introduced subject to the satisfaction of an (implicit) existence assertion. Now a logically necessary statement cannot imply, or presuppose, a contingent statement; the familiar arguments for the fact that a logically necessary statement cannot imply a contingent statement extend directly to presupposition as well. But it is a contingent matter whether Cicero exists. Hence an identity statement which implies, or presupposes the statement that Cicero exists cannot be necessary. Hence

15) $\sim\Box(\text{Cicero}_L = \text{Tully}_L)$.

Since a contradiction results from the assumption of logically proper names, logically proper names are impossible. Or, since (15) is true, (14) is false, and logically proper names of the sort 'Cicero_L' are impossible. Since no logically proper names exist, many of Russell's primary assertions about logically proper names are false, according to Russell's theory of descriptions. Logically proper names represent an attempt to get beyond names altogether, back to their ostensible denotata, things neatly slotted into facts: but since names are distinct from their denotata, this is impossible.

Russell's final argument (in PM, p.67), to show that descriptions do not have a meaning in isolation, rests on an equivocation on 'means the same as'. Russell argues, first, that 'the author of Waverley' cannot mean the same as 'Scott', because if it did (8) would mean the same as (10), which it does not. To guarantee this argument 'means the same as' must be synonymous with

(i) 'has the same sense as', not with

(ii) 'has the same denotation as'.

Mere sameness of denotation (reference) of two subjects does not guarantee synonymy of the sentences in which one is substituted for the other; indeed it does not even guarantee truth-preservation, as substitutions in sentences like 'it is logically necessary that Scott is the author of Waverley' show. As 'Scott' only has the same denotation as 'the Author of Waverley', it does not follow that (10) has the same meaning as (8). All this first argument demonstrates is that 'Scott' does not have the same (Fregean) sense as 'the author of Waverley'; for, if it did, (10) would follow from (8) by Frege's substitutivity principle.

Russell argues, second, that 'the author of Waverley' cannot mean anything other than 'Scott', or (8) would be false. This argument turns on taking 'means the same as' as synonymous with (ii), not with (i) as in the first part of the argument. Hence the equivocation. That 'Scott' denotes the same item as 'the author of Waverley' is, however, a necessary and sufficient condition for the truth of (8). So Russell's conclusion, that 'the author of Waverley' means nothing, does not follow without the equivocation: What is true is that 'the author of Waverley' has the same reference as 'Scott', not that it has the same sense. A related equivocation is also made on the expression 'can be understood on their own'.

The equivocation on 'means the same' is tantamount to an equivocation on 'means', upon which the following argument rests:-

1.12 HOW THE ARGUMENT RESTS UPON AN EQUIVOCATION

> The central point of the theory of descriptions was that a phrase may contribute to the meaning of a sentence without having any meaning at all in isolation. Of this, in the case of descriptions, there is a precise proof: [1] If "The author of Waverley" meant anything other than "Scott", "Scott is the author of Waverley" would be false, which it is not. [2] If "the author of Waverley" meant "Scott", "Scott is the author of Waverley" would be a tautology (i.e. logically true), which it is not. Therefore "the author of Waverley" means neither "Scott" nor anything else - i.e. "the author of Waverley" means nothing, Q.E.D. (59, p.85).[1]

For the second premiss [2] to be true, 'meant' must amount to a meaning equation of at least logical strength (e.g. 'necessarily has the same denotation as', or, differently (i)), otherwise (if, e.g. 'meant' amounted to a contingent relation such as is expressed by (ii)) "Scott is the author of Waverley" would not be logically true but merely contingent. But then the first premiss [1] would fail; for that 'Scott' differs logically in meaning from 'the author of Waverley' does not imply "Scott is the author of Waverley" is false. For the latter to happen, and premiss [1] to be true 'meant' must amount to a denotation equation (viz. what (ii) expresses); but then, as explained, premiss [2] fails.

Russell tries (OD, pp.49-50) to meet theories based on a sense/denotation distinction, or which distinguish meaning from denotation by charging that the theories of meaning thereby adopted are incoherent. But Russell's argument rests on mistaken assumptions from the outset, in particular these (OD, p.47):

(a) When C occurs it is the denotation that we are speaking about, but when 'C' occurs it is the meaning;

(b) The meaning denotes the denotation.

But (b) is simply false, since it is the denoting expression which denotes its denotation; and the sense (or meaning) of an expression is not itself a denoting expression but rather is a property of certain denoting expressions. The relation between sense and denotation is not a denotation relation: the sense fixes the comprehension and it limits the actual denotation classes. Since (b) follows from (a), (a) too is false. The phrase 'speaking about' used in formulating (a) is ambiguous. Insofar as the phrase is tied down to denotation, as suggested by the first clause of (a) it appears that when 'C' occurs we are speaking about the expression (here what denotes the denotation) and not about the meaning. So a denoting expression is not thereby debarred from having, as well as a denotation, a sense; and the sense is not the quotation-name of the expression. An expression such as 'C' has, in general, many different features;[2] denotation may be one of these, sense another. (And sense, properly understood, is not a further sort of denotation.) When (a) and (b) are removed Russell's argument (OD, 47-48) crumbles. In fact the resources of a sense/denotation theory are not required to reveal Russell's equivocation on 'means the same': it is enough to distinguish referential and non-referential uses of subjects.

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[1] The argument could also be stated with meaning giving a relation between terms and objects, e.g. with '"the author of Waverley" means Scott' in place of '"the author of Waverley" means "Scott"'.

[2] See, e.g., the discussion in Goddard-Routley 66.

Since Russell has established neither that descriptions have no meaning in isolation nor that descriptions cannot be values of subject variables, part of the pressure to eliminate descriptions definitionally or to analyse expressions containing descriptions so that descriptions disappear is removed. Russell has however further arguments to show that 'the definition sought is a definition of propositions in which this phrase occurs, not a definition of the phrase in isolation (MP, p.19), and that (PLA, 247-8) 'when a description occurs in a proposition, there is no constituent of that proposition corresponding to that description as a whole'.

One argument goes like this (PLA, p.248; PM, p.66):-

1. There are significant (and true) propositions denying the existence of 'the so-and-so'; for example 'the greatest finite number does not exist'.

2. Such propositions could not be significant if the so-and-so, e.g. the greatest finite number, were a constituent of the proposition, because it could not be a constituent when no so-and-so exists.

3. Such propositions do not contain the so-and-so as a constituent.

Hence an analysis of these propositions must be provided in which 'the so-and-so' disappears. Premiss 2 is, however, unacceptable; and it does not hold unless special postulates of logical atomism are introduced, postulates such as that the constituents of propositions must be actual and that (PLA, p.248) the constituents of propositions are the same as the constituents of corresponding facts. Otherwise the notion of "a constituent of a proposition" is not well-determined. It is not clear that propositions, as distinct from sentences, have constituents; and the phrase 'the so-and-so' is a constituent of the significant sentences in question. So outside the setting of logical atomism this argument is unconvincing.

Related arguments have been extracted by Strawson (OR, 317). Slightly adapted these are:

A. Suppose 1. The phrase 'the King of France' is the subject of sentence S, i.e. 'the King of France is wise'.

Then 2. As S is significant, S is a sentence about the king of France.

But 3. If there in no sense exists a king of France, the sentence 3 is not about anything, and hence not about the king of France.

Therefore 4. Since S is significant, there must in some sense exist the King of France.

But 5. In no sense does the king of France (the round square) exist.

Hence supposition 1. is mistaken. Hence too 'the king of France' is not a constituent of S when S is correctly analysed.

B. Suppose 1. Then 2.

Also 6. As S is significant, it either is true or false.

By 2, 7. S is true if the king of France is wise, and false if the king of France is not wise.

But 8. The proposition that the king of France is wise and the proposition that he is not wise are alike true only if there exists something which is the king of France.

From 6, 7 and 8, 4 follows, so it is argued. Thus, as before, supposition 1 is mistaken.

In argument A, quite apart from dubious premisses and ambiguities in words like 'analysed', equivocations are made on the words 'about' and 'anything'. 'Anything' in 3 is ambiguous between 'anything actual', in which case the first clauses of 3 are not inconsistent with 2, and 'any item', in which case the second part of 3 does not follow from the first. In the sense of 'about' in which 2 is true a subject-predicate sentence is about the subject item, and the item need not be an entity. But in the sense of 'about' in which 3 is true a subject-predicate sentence may only be about an actual subject-item. Once this equivocation is removed, 2 and 3 are not inconsistent, so 4 does not follow. Independent arguments against 4 have already been adduced (in §2).

Argument B also fails to establish that supposition 1 is mistaken, even conceding premiss 6. For 8 is false, by the independence principle. The wise King of France is wise, even if the wise king of France does not exist. In contrast, the proposition that (the king of France)^E is wise, where the superscripting shows existential loading, is true only if there exists something which is the king of France. But under this construal which guarantees 8, 7 is false. For then "(the king of France)^E is wise" is true if both the king of France is wise and the king of France exists, and it is false if either the king of France is not wise or the king of France does not exist. Finally if 'the king of France' were replaced throughout 8 by '(the king of France)^E' and 7 amended then 4 would not follow. Moreover with or without the replacement, 4 is clearly false (see also Strawson, OR; and Slog chapters 3 and 7).

Once these arguments are undercut there is nothing to stop us reverting to what even Russell thinks is the obvious account of such sentences as

16) The round square does not exist ;

namely, as attributing the property of not existing to the round square, or as denying the existence of the item, the round square. Russell's contention (PM, p.66) is that (16) cannot be regarded

> as denying the existence of a certain object called "the round square". For if there were such an object, it would exist: we cannot first assume that there is a certain object and then proceed to deny that there is such an object.

This argument, from negative existentials, fails, as we have observed, once set outside the restrictive assumptions of the Reference Theory. For 'object' cannot be read 'entity', since it is wrong to construe (16) as denying the existence of an entity, the round square. But unless 'object' is read 'entity', it does not follow from the fact that object a does not exist that object a does exist (Ontological Assumption application) or that there exists an object that does not exist (Existential Generalisation).

Certainly if there were^E exactly one round square, the round square would exist. But if some item is (=) the round square, it does not follow that the round square exists. So in denying the existence of such an item as the round square one does not first (have to) assume that it exists. Hence there is no pressure to analyse sentences containing descriptions which denote nothing actual so that the descriptions vanish. Definite and indefinite descriptions do not have to be construed as incomplete symbols, but may instead be admitted as primitive expressions.

Summing up, Russell has established neither that descriptions cannot be taken as values of variables, nor that descriptions lack both sense and reference and have no meaning in isolation, nor that descriptions can only be defined contextually. Thus the main pressure to eliminate descriptions, by analysing expressions in which they occur, is removed, and the main motivation for Russell's theory thereby destroyed. More generally, there do not seem to be any a priori objections to constructing theories which

(ai) admit definite and indefinite descriptions as values of variables;

(aii) do not define descriptions contextually, but take at least some sorts of descriptions as primitive well-formed terms; and

(aiii) do not provide, or admit generally, an eliminative analysis (or "theory" in a narrow sense) of descriptions, but take them as more or less in logical order as they are.

Such theories can be consistently designed, and have much to recommend them. They are naturally geared to a neutral logic, since many of the objects descriptions designate do not exist; they stand a vastly better chance than standard theories of assigning the intuitively right truth-values to sentences in which descriptions occur since inflexible eliminations are not obligatory; they can bring out the crucial cases of Meinong's truth-value assignments; and they offer the prospect of more satisfactory intensional logics. Furthermore independent considerations support (ai)-(aiii) as correct. For instance, such implications as "Everything is red or not red implies that Pegasus is red or Pegasus is not red", "Every item is self-identical implies that a round square is identical with a round square" do have initial intuitive appeal as correct implications. If subject variables do hold places for all subjects - there is nothing to stop us giving them such a range, and excellent reasons in a neutral logic for giving them such a range (see Slog chapter 3) - then 'Pegasus and 'the round square' will be among the substitution values of the variables. Given such variable values the implications cited are correct, simply by instantiation. Given such a variable range more restricted variable ranges can be introduced as well. Thus adopting, as we shall, very wide subject variable-ranges has the added advantage of giving the theory greater generality as compared with classical theories like Russell's. Finally, in defence of (ai), descriptions are admitted all the time as replacement values of variables in philosophical and mathematical arguments, without any evidence that Russell's and Hilbert's existential and other requirements on introduction of descriptions are met.

Given (ai), (aii) appears essential if the introduction of descriptions of all sorts is not to result in inconsistency; and given (ai), (aii) can certainly be guaranteed, even if it does not prove the most economical course. Defence of (aiii) is more difficult. Because of the sheer diversity of predicates, any contextual definition of descriptions seems bound to give the wrong value assignments for some classes of predicates; and all the more immediate, and so far proposed, contextual definitions do so fail (see further chapter

4). It is argued subsequently (in chapter 8) that all such contextual definitions do fail and that an adequate eliminative analysis is impossible. Similarly, as earlier remarked, the usual alternative to (aii) of starting with existentially loaded expressions and then introducing by definition expressions which do not carry such ontological loading, ontologically neutral expressions, appears to be impossible, if it is to be achieved without prejudging and assessing wrongly the content-values of many expressions. And it is certainly not possible to eliminate ontological commitment in a contextual theory of definite descriptions set within classical logic. For ontological commitment is not eliminated but merely transferred to quantifiers. Under Russell's theory, for example, descriptions and also quantifiers are ultimately explained, from a substitutional view point, in terms of logically proper names, and these names carry by their very definition existential loading.

Since proper names and descriptions are to be admitted as substitution-values of variables, the grammatical predicates 'exists' and 'is possible' should be admitted as values of predicate parameters. For one wants to be able to formalise and to represent in arguments such significant sentences as 'Pegasus does not exist, but is possible'. It follows then that 'a exists', where 'a' is a proper name, is significant. Russell, however, contends - what seems patently false - that 'a exists' and 'a is unreal' are meaningless; that

> it is only of descriptions - definite and indefinite - that existence can be significantly asserted; for if 'a' is a name, it must name something: what does not name anything is not a name ... (MP, p.23).

He claims that

> it is only where a propositional function comes in that existence may be significantly asserted. You can assert 'The so-and-so exists', meaning that there is just one c which has these properties, but when you get hold of a c that has them, you cannot say of that c that it exists, because that is nonsense (PLA, p.252).

These points are hardly conclusive. Even granted a name must name some item, it does not follow that the item must be actual. 'Santa Claus' and 'Vulcan' are names, though admittedly logically improper ones. Thus it is false that 'what does not name anything^E' is not a name. Moreover even if an entity a is right in front of one, it still seems significant to say 'a exists' or 'this exists'. That such a claim is unusual and often pointless does not imply that it is non-significant; and it may not always be pointless; consider 'See, Santa Claus does exist', 'Look, this exists, contrary to what you asserted'. Moreover, in order for "this exists" to be tautologous, as is sometimes erroneously claimed, or contextually self-vindicating, the sentence must be significant. Further, many items that can be ostensively named can also be described.[1] Suppose for instance that

a = the item which has Φ (e.g. which is a).

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[1] On Russell's theory this is true for ordinary proper names which are really concealed des-riptions, but as regards logically proper names Russell would deny it. The separation is enforced by a sharp distinction between acquaintance and description, and a corresponding epistemic distinction between knowledge by acquaintance and knowledge by description. But neither distinction stands up to too much examination; and though divisions can be made the requisite sharpness of the divisions is an illusion.

Then Russell admits that 'items which has Φ exists' is significant. But isn't the predicate 'exists' transparent? So doesn't it follow, first, from "the item which has ϕ exists" that "a exists", and, secondly (in a similar way, or from the first inference and its converse), from the significance claim that 'a exists' is significant. But Russell would reject these very plausible arguments and various related arguments (see PLA, p.233) on the ground that only of propositional functions can existence be asserted or denied significantly. Since the previous points seemed to show that this is not so, what is Russell's case? Russell compares 'exists' with the non-distributive predicate 'is numerous'. But the analogy breaks down; for example, the sentence 'the author of Waverley no longer exists' is significant, even on Russell's theory, but 'the author of Waverley is no longer numerous' is not; and the inference 'Men exist; Strawson is a man; therefore Strawson exists' even if incorrect (replace 'Strawson' by 'James Bond') has some appeal and is not nonsense like the inference 'Men are numerous; Strawson is a man; therefore Strawson is numerous'. In fact the existence of a plurality, or natural manifold, is a matter of the existence of its elements, whereas its numerousness is not; blue whales exist only if some members of the manifold of blue whales exist, whereas blue whales are numerous only if the manifold has many members. So it is (as it should be) significant to speak of the existence of individual members of manifolds and classes, and why should not these belong to various classes, e.g. to the class of prophets?[1] As against Russell (PLA, 234), it seems that existence propositions like "Moses exists" do say something about the individual Moses, and not simply about the class (propositional function) whose sole member (value) is Moses.

Russell's theory of descriptions, like its classically based rivals, immerses one in platonism. For in order to argue about any definite (or indefinite) item in detail using Russell's logic one must assign properties to that item: otherwise one will not be able to apply the predicate logic. But if any properties are assigned to items, then according to the theory that item exists. Since mathematical objects have properties, they all exist. Not surprisingly classical logic commits adherents, who almost invariably wish to retain much of mathematics, to the existence of abstract sets and transfinite numbers, and to the galaxy of entities of platonistic mathematics. For these theories of course embody the Ontological Assumption (as formulated, e.g. in proposition *14.21 of PM). By contrast, the theory of objects leads to none of these ontological excesses. Mathematical objects, for example, do not exist; mathematics is an existence-free science (see p.29).

It is astonishing, then, that it is Meinong who is so frequently accused of ontological extravagance, and nowadays not uncommonly associated with Descartes' notorious ontological proof of the existence of God. As regards ontological commitments, so also as regards ontological proofs, it is the reductionist opposition to Meinong, not Meinong, that has the excessive existential commitments. The extent to which philosophical myth has entirely reversed the true situation will emerge from an examination of the leading modern alternative to Russell's theory of descriptions.

§13. The Sixth Way: Quine's proof that God exists. The traditional arguments for the existence of God, for instance, the famous Five Ways of St. Thomas Aquinas, were not intended to show that the God whose existence was

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[1] It is a major weakness of Russell's proposed definition of class existence that 'exists' does not distribute. Once nonentities are admitted, one has, on Russell's definition, such ludicrous results as that the class consisting of Pegasus, Santa Claus and Quine exists.

proved had all the properties normally expected of him,[1] and the arguments on some occasions attributed some rather surprising features to the Deity, e.g. that all sewers and compost boxes were part of him. It is the same, as we shall very shortly see, with the Third Way, which will henceforth serve as a model. And it is the same with the modern argument which follows: once again, the argument itself is not any the worse for that: it will simply have to be supplemented by additional arguments designed to adduce other expected features.

Aquinas's Third Way is supposed to establish the existence of a First Cause, which is then identified with God. Until recently, modern philosophican gospel had it that the argument to the First Cause was unsound, suffering from manifold deficiencies. It is now known that the argument can be made mathematically rather more respectable, though of course not assumptionless, by appeal to the Axiom of Choice. The folkloric argument (which I learnt from Meyer, who said that it had come down to him from Putnam, who said ... Alfarabi) is in essence as follows:- Consider the set E of (sometime actual) events. It is certainly non-null and it is particularly ordered by the effect-cause relation. Now consider an arbitrary chain (i.e. totally ordered subset) in E. By essentially Aquinas's argument this must have an upper bound. Hence, by Zorn's lemma, E has a maximal element; but as maximal this element has no causal predecessor, and is accordingly a First Cause. Though the argument proves more than just a First Cause (e.g. by symmetry it equally proves that there exists a Final Effect), it does not of course without much further ado establish the other expected properties of God, e.g., most important, that God is First Cause, or that God is worship-worthy - nor was it intended to or pretended to by its advocates.

Given the argument the proposition that God exists is, in fact, equivalent to the Axiom of Choice, using expected connections. For the Axiom of Choice materially implies Zorn's lemma, which materially implies that God exists, given that God is a First Cause. And conversely, that God exists materially implies that a supreme choice maker exists (given such expected properties of God as omnipotence), so the Axiom of Choice is guaranteed.

Accordingly it may be considered something of a virtue (for once) of Quine's set theory ML (of ML) that it fails the Axiom of Choice (no First Cause in this way for Quineans unless E should turn out to be Cantorean). There is however no such escape from theism for MLers: for there is a Sixth Way, unknown to Aquinas, which establishes, using just the logical apparatus furnished in ML, that God exists. Once again, although the argument does show that MLers are committed to the existence of God, the argument does not pretend to show that the God shown to exist has other expected properties of the deity: these have to be argued for somewhat independently - insofar as they can be.

There is a further virtue of the ML argument: unlike the rehashed Third Way, it is classically valid. Those accustomed to the ways of Zorn's lemma will have observed that (unfortunately?) the argument bogs down where applications of Zorn's lemma frequently encounter trouble (fortunately for its integrity), namely in showing that every chain of E has an upper bound. A well-publicised objection to the Causal Argument is precisely to the effect that not every chain is bounded above.

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[1] As Hospers remarks of the Causal Argument (56, p.327).

> A preliminary caution about the argument: If it establishes the existence of a Deity, it establishes nothing whatever about the Deity's characteristics except the characteristic of being the Cause of the universe.

To descend to mundane details:- Quine (in ML, p.150) tries to escape a serious dilemma, that of either admitting that 'God' and 'Pegasus' both exist or of banishing such names from logical discourse, by introducing 'God' and 'Pegasus' as abbreviations of '(ιx) god x' ('the God') and '(ιx) peg x'. The escape is illusory. As regards the God, there are just two cases:- Either the uniqueness condition $(\exists y)(x)(x = y \equiv .\ \text{god } x)$ is satisfied, and the main tenet of monotheism holds; or else the uniqueness condition fails and, by ML *197 (ML, p.148),

(1) (ιx) god $x = \Lambda$ i.e. the x such that x godizes is the same as the null set.

But it follows very simply from (1), using well-advertised principles maintained by Quine, that the God does exist; and accordingly, given Quine's contentions, the main tenet of theism, that God exists, holds.

There are many routes to the damaging conclusion:

(i) Λ is the value of a bound (existential) variable; see, e.g., the proof of ML †240.

(ii) To exist is to be the value of a bound (existential) variable (see the statement in Carnap MN, p.42 and references given there, and also WO, p.242). Hence, by (i) and (ii),

(iii) Λ exists.

(iii) may alternatively be derived as follows: Since $\Lambda = \Lambda$, by ML *231 and †182,

(iv) $(\exists z)(z = \Lambda)$, by *232. But (iv) is equivalent to (iii) (as Quine concedes WO, pp.176-179). Further

(v) 'Exists' is a referentially transparent predicate, since, e.g., the predicate 'exists' is true of everything (ML, p.150, WO, p.176). Alternatively, (v) follows from the theorem $x = y \supset .\ (\exists z)(z = y) \supset (\exists z)(z = y)$, using the equivalence, x exists $\equiv (\exists y)(y = z)$, already noted under (iv). (This equivalence must hold, even though Quine excludes 'exists' from the formalism of ML, since both predicates are said to be true of everything.) Finally from (iii) and (v),

(vi) $((\iota x)$ god $x)$ exists.

Alternatively from (iv), by *223 and (1), or directly from (1) by *232,

(vii) $(\exists z)(z = (\iota x)$ god $x)$;

and as before (vii) guarantees (vi). Thus the God exists in the one and only sense of 'exists' that Quine will really tolerate (see, e.g., WO, p.241-2). Similarly for nonentities such as the Pegasizer: attempts to deny their existence in the applied system ML force the admission of their existence. Quine seems to have got entangled in Plato's beard.

Some features of Quinean deism are easily adducible. In particular, the deism is a monodeism. Further, it is a very hospitable religion, in an odd way; for everything that is in the ordinary way said not to exist, Pegasus, Sherlock Holmes, all the gods of the Greek pantheon, are one with God (at least if the religion is approached from the "atheistic" direction). Actually, the doctrine admits of improvement,[1] so that, among other things, the excessive and heretical hospitality is removed Replace (1) by

(1') $(\iota x)\text{god } x = V$;

God coincides with the universe of everything that exists. The damaging result that God = Sherlock Holmes is removed, since $\Lambda \neq V$; and a pleasant pantheism emerges. For 'God is everything and everything God' (OED definition of 'pantheism'). Each of us relates to God, by being an element, and also a part, of God; and so on. Nor is it difficult to see that God may be considered an object of awe and worship-worthy,[2] since he is the totality of all that exists, the sun and all it illuminates, the firmament of stars.

The objection is quite general. Analogous objections work against any other "queer-entity" theories of description, i.e. against method IIIB of Carnap (MN, p.36). The argument applies against any theory of descriptions which has descriptions which do not satisfy the unique existence clause, designate some existent object(s), where a transparent existent predicate is definable. So the objection applies not just to Quine (in ML) but to Frege, Martin, Carnap (see references in MN), Scott, Kalish-Montague 64 and others. Consider any description '$(\iota x)kx$', where 'k' is an extensional predicate and $(\iota x)kx$ does not exist. Then Carnap's and Martin's theories of definite descriptions (both discussed in MN, circa p.36) lead to the obnoxious result - even for internal existence brinkmanship - that $(\iota x)kx$ does exist. For example, Carnap claims as an advantage of his method, what is a disadvantage of Russell's method (MN, p.34), that the inference of 'specification and existential generalisation are ... valid also for descriptions (at least in extensional contexts)' (MN, p.35). But given these inferences it follows from the reflexivity of identity (MN, p.14), in turn:

(a) $(\iota x)kx = (\iota x)kx$

(b) $(\exists y)(y = (\iota x)kx)$.

Even if the warrant to move to (b) by existential generalisation were withdrawn, (a) certainly holds on Carnap's theory: this follows from 8-1 (MN, p.37) and from $a^* = a^*$, a consequence of the reflexivity of identity of the null entity, since 'a^*' is an individual constant. Now analyse the left-hand description of (a) according to MN 8-1 and use the fact that $(\iota x)kx$ does not satisfy the uniqueness requirement: then

(c) $a^* = (\iota x)kx$

(c) may alternatively be established by reductio from the supposition that $\sim$(c). Similarly the uniqueness of a^* follows. Applying these results, the obnoxious (b) and

(b') $(\exists! y)(y = (\iota x)kx)$

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[1] Such improvements a Quinean can hardly resist; for what happens to definite descriptions when the uniqueness clause fails is accounted a Don't Care. So why not make the inevitable deism more attractive?

God's position, as near to the Absolute as we can attain in Quinean theory, is unfortunately somewhat insecure, since the theory may well be inconsistent.

[2] Similarly perhaps when (1) is adopted in ZF set theory, the null set, as furnishing the effective universe of modern set theory and as enabling the construction of all numbers may even be reckoned worship-worthy.

follow. Any item $(\iota x)kx$ which does not exist, exists - internally - after all! Yet, according to Kalish and Montague (64, p.234),

> In the case of improper definite descriptions, that is expressions of the form [the object α such that ϕ] for which either no object or more than one object satisfy ϕ, ordinary usage provides no guidance; it therefore falls to us to specify this meaning. It is convenient to select a common designation for all improper definite descriptions. What object we choose for this purpose is unimportant, but for the sake of definiteness, let us choose the number 0,

one of Frege's choices. Their statement reveals a marked insensitivity to ordinary usage.[1] For the theory verifies not merely what are ordinarily considered gross falsehoods but also category mistakes, e.g. 'Sherlock Holmes is a number', 'All fictional objects are numbers' (and, conversely presumably, natural numbers are fictional objects being successors of 0 which is a fictional object), 'The king of France is less that 1' (p.235), and 'The king of France multiplied by 12 is Sherlock Holmes'. Likewise the idea that 'it falls to us to specify the meaning' of nonreferring descriptions is entirely mistaken; and so is the idea that the choice of designation is a matter of convenience. For both conflict with much hard data, such as that fictional objects are mostly not sets, not numbers, and do not exist.

The general moral is that no Fregean-style theory of descriptions which sends all descriptions which are about nothing existent to some (allegedly) existent object can be other than a travesty. There is only one way out of the difficulty on this style of theory, and that is to introduce a null item, a* say, which does not exist. But if one such item were introduced into the theory (in defiance of the Reference Theory and especially of classical quantification principles), why not introduce several? For this would resolve other potent difficulties of the theories, such as that God and Pegasus are not identical and not generally believed to be identical?

For a very serious defect of Fregean-style theories is abysmal performance in intensional sentence contexts. People's beliefs, thoughts and attitudes towards particular gods or unicorns or attributes are not beliefs, thoughts and attitudes towards the null set (or whatever replaces it, e.g. 0, the null entity, the non-self-identical).[2] This is of course realised by most exponents of such theories, who restrict their theories, in one way or another, to extensional languages (e.g. Kalish-Montague 64, p.116). But then no account of the logical behaviour of descriptions in intensional sentence frames remains. That is, such theories so restricted are radically incomplete, in a way the Russell's theory at least is not.

A more sophisticated approach than the Kalish-Montague procedure of excluding intensional discourse, is to admit the discourse but under such restrictions, on normal and legitimate logical operations, that its intensionality cannot emerge. That is, the discourse is effectively extensionalised. Consider statements such as 'Charlie is thinking about a winged horse'. Here the neo-Russellian no-analysis "solution" consists in extracting the subject 'Charlie' and treating the remainder as an unanalysable predicate, and forbidding the extraction of 'a winged horse' as a proper term in addition to 'Charlie' (cf. Quine WO). The advantage of this is that it enables one to assign to such statements the truth-value true if one is so inclined. But this advantage is bought at a heavy price. For first, since one cannot treat such statements as genuinely relational, one is deprived of the usual semantical explanation for their truth. Secondly, one needs to be able to treat the statement as relational and extract the nonreferring term as a proper subject in order to preserve apparently general transformations which convert subject-predicate statements to relational ones, e.g. xf iff x =a y which fs, and in order to carry out many normal logical operations with the statement and to formalise and assess arguments in which it appears. Similarly one needs to treat the predicate as a predicate of the nonreferring term in order to allow for attribution of both it and some (other) extensional predicate to the same subject, as in 'The present King of France does not exist but he is thought to by some people', where the whole point is to attribute both properties to the one item, the King of France. In short, although one is able to retain in this fashion pre-analytic truth-value assignments for some such statements, doing so depends upon cutting such statements off from normal uses and transformations, and hence depriving them of most of their logical power.

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[1] An insensitivity already evident earlier in their book, e.g. in the treatment of 'if'.

[2] A similar objection will be lodged in the next section against Lambert and van Fraassen's free description logic 67.

§14. *A brief critique of some more recent accounts of proper names and descriptions: free description theories, rigid designators, and causal theories of proper names; and clearing the way for a commonsense neutral account.* The decided unsatisfactoriness of all the standard theories of descriptions[1] has not passed unnoticed, and free logicians have been at work trying to design more adequate theories.[2] It is not difficult to see that some of the worst difficulties of classical description theory can be avoided in a free logic setting. For consider a described object a that does not exist, e.g. the Greek god Apollo. Then a can be allowed to be a term of free quantification theory, so for example $a = a$, without a's existence, as represented by $(\exists z)(z = a)$, automatically following by Existential Generalisation. As EG is modified in free logic to FEG, a's existence would only follow given the further assumption (which does not hold) that a exists, i.e. aE. Accordingly too, free logic can satisfy some of the desiderata (ai)-(aiii) already presented for a satisfactory theory of descriptions, without yielding unwarranted existence claims. For example, free description theories characteristically take descriptions as primitive terms, which are substitution values for *free* variables. There is no need to reduce these descriptions to quantified expressions, and in general free logic descriptions are not so eliminable, in terms of quantifiers. The limitations to free variables, coupled with the existential qualifications on particularisation and instantiation, means, however, that *there are severe limitations on the amount of information concerning described items that do not exist that can be logically assessed in free logic*. Thus, for example, the main system of free logic studied in Lambert-van Fraassen 72, the system FD, called the minimal *free* description theory, gives *no* information (other than that supplied by quantification logic with identity) as to *any* described items that do not exist. The reason is simply explained and worth explaining. A free description theory results upon adding definite descriptions as terms to free quantification logic with identity,[1] and subjecting the new terms to certain axiomatic conditions. *Minimal* free description theory FD (of 72, p.206) is characterised by the *basic scheme*

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[1] That is, to be more specific, all the theories considered in MN, p.32 ff., and minor variations thereupon. It is worth recalling how old most of these theories now are; the main theories, those of Frege and Russell, go back more than 70 years.

A useful addition to Carnap's telling criticism (in MN) of the third theory, that of Hilbert-Bernays, may be found in Scott 67, pp.181-2.

[2] They have been at work for at least four decades. The history of free logic and free description theory apparently has not been documented, but some of the antecedents are clear enough. The distinctive theses of free logic may be found in Moore, and indeed are implicit much earlier, e.g. in Mill's work. For example in 1927 Moore wrote (59, p.87); see also p.88):

> I entirely deny that fa is entailed by 'for all x, fx'; fa is entailed by the conjunction 'for all x, fx' and 'a exists'.

That Moore took quantifiers as existentially-loaded is evident not only from this passage but from many other places in his work (e.g., 59, p.118). Modern symbolic free logic is often said to begin with Leonard 56, where important principles of free logic and free description theory are studied. The modern subject begun to flourish about the early Sixties: See especially Hintikka 59, Leblanc and Hailperin 59 and Lambert, e.g. 63. Smiley's 60, although it really involves a many-valued many-sorted theory, is in the same tradition, the broader free logic tradition that uses (and usually is prepared to use only) existentially-restricted quantifiers and accepts the thesis that everything exists and Quine's criterion for ontological commitment. Earlier nonclassical work outside that tradition includes Lejewski 54 and Rescher 59.

FDL. $(\forall y)(y = \iota xA(x) \equiv. A(y) \ \& \ (\forall z)(A(z) \supset. y = z))$.[2]

When $\iota xA(x)$ exists, by free logic instantiation, since $\iota xA(x) = \iota xA(x)$ always, $A(\iota xA(x))$ and also $(\forall z)(A(z) \supset. \iota xA(x) = z)$, thus giving fundamental principles of standard description theory. Specifically, FDL yields the following familiar scheme where ιxA exists, i.e. $(\exists y)(y = \iota xA)$:

CD. $B(\iota xA) \equiv (\exists y)((\forall x)(x = y \equiv. A) \ \& \ B(y))$.

Proof is, in outline, as follows (use of specific constants is readily eliminated by way of generalisation and distribution of $\exists$). Suppose, firstly, $B(\iota xA)$. Since $(\iota xA)E$, by FDL, as before, $(\forall z)(A(z) \equiv. \iota xA = z)$. Hence existentially generalising on ιxA and changing broad variables, $(\exists y)((\forall x)(x = y \equiv A) \ \& \ B(y))$. Suppose, conversely, that there exists a y such that $(\forall x)(x = y \equiv A)$ and $B(y)$. By the first, since $(\iota xA)E$, $\iota xA = y \equiv A(\iota xA)$. But by FDL, $A(\iota xA)$ so, $\iota xA = y$. Hence, by IIA, $B(\iota xA)$. CD is regularly taken as a common denominator of theories of descriptions, as a principle any decent theory of descriptions would satisfy. Likewise FDL, whence CD derives, is often taken as completely solid, as impervious to criticism. Not so, in either case. For the principles, applied generally, assume, what is false,

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[1] As in the classical case (cf. §11) the identity theory customarily adopted requires modification: see the discussion of assumption (1) just below.

[2] Strictly, with y not free in $A(x)$.

(1) All descriptions are Leibnitzian, i.e. for every existing y, if $y = \iota xA$ and $B(y)$ then $B(\iota xA)$;

(2) The definite descriptor ι (read 'the'), is always existentially loaded, i.e. the is the^E, the existing;

(3) Definite descriptions (where well-behaved) meet a strong uniqueness requirement.

The assumptions will appear quite explicitly when we come (in §22) to proving the basic scheme FDL in neutral logic; but that they are tacit assumptions of free logic (as almost always presented) is readily brought out. Assumption (1) has already been used in deriving CD: if the identity determinate of CD is extensional identity - as it would be if everyday and everyday philosophical purposes were being taken into serious account - then (1) is subject to the proviso: provided B is an extensional frame. Even if (as so often in logic and philosophy, to their detriment) the model is pure mathematics, where the usual identity determinate is strict identity, the qualifications, provided B is a strict frame, would be required. Otherwise the scheme CD, which includes no scoping provisions, would let through intensional paradoxes (as indicated in §11).[1]

In accordance with the (misguided) guiding principle of free logic, that bound individual variables should range only over a given domain of entities (Scott's principle in 67, p.183), the free logic descriptor 'ι' which always (by the formation rules and accompanying definition of bound variables) binds variables, is existentially restricted. That is, assumption (2) is an integral part of free logic. But many natural language definite descriptions do not conform to the assumption, e.g. 'the thing a fears most', 'the object of her desires', and (though more controversially) 'the least rapidly convergent sequence', 'the round square' and 'the detective Conan Doyle wrote about' (the fuller case is a repeat of that of §4). Hence assumption (2) is, like assumption (1), false.

The uniqueness assumption (3) is not confined to free logic theories, but is shared with standard theories such as Russell's. The issue is best approached through the following immediate consequences of FDL:

$(\exists y)(y = \iota xA) \equiv (\exists y)(A \,\&\, (\forall z)(A \supset.\ y = z))$, from FDL distributing $\exists$.

Hence since $zE \equiv (\exists y)(y = z)$ and (using IIA) $A(y) \equiv (\forall z)(y = z \supset.\ A(z))$;

EU. $(\iota xA)E \equiv (\exists! y)A$,

where the existential uniqueness quantifier, $\exists!$, is defined $(\exists! y)A =_{Df} (\exists y)(\forall x)(x = y \equiv.\ A)$, with the uniqueness defined over entities, i.e. y is unique among what exists. Scheme EU corresponds exactly to one of Russell's two definitions, namely PM *14.02. Thus the two basic principles of Russell's theory are both represented, even in minimal free description theory, by EU and CD; but CD, which is scope free and existence qualified is substantially weaker than *14.01 of PM. The main reason for going, for having to go, beyond the minimal free theory is to try to make up some of the difference. In view of the correspondence, some of the criticism made of Russell's theory (in §12) transfers to free description theory, as for instance any criticism based on EU. An important criticism of Russell's theory, and of all theories of definite descriptions so far worked out, is that the uniqueness requirement imposed (for example in CD and EU) is too strong, that natural language definite descriptions do not conform to such a requirement. Consider the remark:

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[1] Subsequently, in §22, it will emerge that not only B but A in both CD and FDL should be subject to an extensional restriction. Lambert and van Fraassen, later in 72 (p.215), do reformulate their identity theory to permit replacement only in atomic wff, a procedure equivalent in logical results to the extensional identity theory of EI (see footnote 12 thereof). However this is not good enough: it should also be required, as at least a tacit interpretational condition, that all atomic parameters are extensional. Otherwise faulty replacements can be carried through using atomic wff.

(a) The red-headed man is gorging himself on meat pies.

The statement may well be true, despite the fact that more than one entity is a red-headed man. It is enough that one red-headed man is indicated in the context of (a) and that that man is gorging himself on meat pies. The uniqueness requirement of CD is too strong. Similarly EU is countered by such remarks as (b) below -

(b) The red-headed man (still) exists ,

said, for instance by crooks or secret service agents who thought the man was dead. The truth of (b) does not imply that there exists uniquely a red-headed man, so EU is also false when applied to natural language descriptions. Thus uncontroversial as EU is among logicians, it is falsified as soon as it is applied to real-life examples, which do not require strong uniqueness. To be sure one can define a logicians' the which satisfies the strong uniqueness condition, just as one can define a material conditional, and it is useful to do so. But natural language definite descriptions diverge in their behaviour from the logicians' contrivance. Uniqueness is not a matter of uniqueness with respect to every entity in the world, as with the material the, but a contextually-determined matter. It is enough in the case of (a) that in the class determined by the context of (a) at most one element is a red-headed man. The requisite point has been noticed, though in a quite different setting, by Strawson:

> For him [the speaker] to be referring to just one particular, it is not enough that there should be at least one particular which his description fits. There must be at most one such particular which he has in mind (59, pp.182-3).

The intentional element may be taken up contextually (see §22).

The conclusion reached is that free description theory is not adequate to handle descriptive discourse about what does exist. Insofar as it accommodates discourse about what does not exist, the situation is even worse. In the minimal theory, detachment is precluded, when $\iota xA(x)$ does not exist, so no properties can be assigned to $\iota xA(x)$ using FDL. (Nor are we given counter-factual information in the way Lambert-van Fraassen tend to suggest, p.206; for the conditional is material, so all that scheme FDL yields is the form, $\sim(\iota xA(x))E \vee \ldots$, which is immediate independently from $\sim(\iota xA(x))E$.)

Nor can the free logic theory of nondesignating descriptions be satisfactorily rectified, because free logic provides no ways of talking generally about what does not exist. A basic problem, that is, with free description theory derives from the inexistential inadequacy of its underlying quantificational logic. The problem is thus not avoided by strengthening minimal free description theory, though plainly, there are ways of strengthening the theory. In fact those that have so far been offered are of comparatively little merit in the enterprise of formalising the logic of discourse about what does not exist, and also reveal how little help free logic is going to be in the elaboration of existence-free formalisations of mathematics and theoretical sciences. Consider, for instance, the 'strong' theory FD2 (of Lambert-van Fraassen 67, sketched in 72, pp.201-2) which results from FD by addition of the nonentity collapsing postulate

F2. $t_1 = t_2 \equiv (\forall y)(y = t_1 \equiv. y = t_2)$,

i.e. objects are identical iff (materially) they are identical to the same entities. Since nonentities are never identical with entities it follows that they are all identical; there is just one nonentity, a^*, say, which can be taken as $\iota x(x \neq x)$. Thus the round square, the golden mountain and Apollo are all one and the same, and they are identical with each of the numbers. The identification of all nonentities, 'which may be both perfectly harmless and very useful in some contexts' (72, p.202), renders the theory rather worthless for philosophical purposes and decidedly harmful for existence-free mathematics. Furthermore, FD2 fails in intensional applications. For it yields essentially Carnap's scheme (MN, p.37):

$$B(\iota xA(x)) \equiv (\exists y)((\forall x)(A(x) \equiv. x=y) \,\&\, B(y)) \vee \sim(\exists y)(\forall x)(A(x) \equiv. x=y) \,\&\, B(a^*).$$

Now take B( ) as 'Routley believes that ... is distinct from a^*', with $a^* = \iota x(x \neq x)$, and $\iota xA(x)$ as 'the winged horse Pegasus'. Since the winged horse Pegasus does not exist, it follows:

Routley believes that Pegasus is distinct from a^*
iff Routley believes that a^* is distinct from a^* ,

which is false.[1]

The free description theory of Scott 67 - which illustrates well both the limitations and strength of free logic description theory and how rectifying it leads beyond free logic - is at the same time faulted. For Scott's theory of descriptions is effectively equivalent - as a theory of descriptions, not as a theory of terms - to theory FD2;[2] in both theories so-called proper

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[1] In fact, minimal free logic FD (of 72, p.157 ff.) also fails in intensional settings but the failure may be ascribed to the presence of a full indiscernibility principle in the underlying identity logic, a principle Lambert-van Fraassen subsequently remove in part.

[2] Scott's system differs from FD2 in lacking constants and only containing a single two-place predicate: This difference is unimportant: constants and a full set of predicate symbols are readily added to the system without essential variation in the logic: call the result of such additions SS. The logic of SS is quantified free logic with Leibnitz identity together with the following two schemes for descriptions (rewritten, for the purposes of comparison, in the notation of the text):

(continued on next page)

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[2] (continuation from page 141)

I1. $(\forall y)(y = \iota xA \equiv. (\forall x)(x = y \equiv. A)$, with y not free in A;

I2. $\sim(\exists y)(y = \iota xA) \supset. a^* = \iota xA$, where a^* (Scott's *) is defined as for FD2.

I1 just is the basic scheme FDL. In order to prove the effective equivalence of the theories of descriptions of FD2 and SS, it remains to show - since the underlying free logics are the same - that I2 is tantamount to F2 in the case of descriptive terms.

ad I2, given FD2. Since $(\forall y)(y = y)$, $\sim(\exists y)(y \neq y)$. By FDL, $(\exists y)(y = \iota xA) \supset (\exists y)A$, so $(\exists y)(y = a^*) \supset (\exists y)(y \neq y)$. Hence $\sim(\exists y)(y = a^*)$, i.e. $\sim E!a^*$. But by F2, $\sim E!t \ \& \sim E!t' \supset. t = t'$ (see Lambert-van Fraassen p.202), whence $\sim E!\iota xA \supset. a^* = \iota xA$, i.e. I2.

ad F2 for descriptions, given SS. Firstly for any terms t_1 and t_2, $t_1 = t_2 \supset (\forall y)(y = t_1 \equiv. y = t_2)$ in SS, by applying Scott's UG to transitivity of identity. For the converse half of F2 suppose $(\forall y)(y = t_1 \equiv. y = t_2)$; to show, where t_1 and t_2 are descriptions, $t_1 = t_2$. There are 3 cases.

Case 1. $E!t_1$, i.e. $(\exists z)(z = t_1)$. Then by Scott's UI, i.e. existence restricted instantiation, $t_1 = t_1 \equiv. t_1 = t_2$, whence $t_1 = t_2$.

Case 2. $E!t_2$. Similar to case 1.

Case 3. $\sim E!t_1 \ \& \sim E!t_2$. In this case, and this case only, the assumptions that t_1 and t_2 are descriptions is required. Then by I2, $a^* = t_1 \ \& \ a^* = t_2$, so $t_1 = t_2$.

It is evident that Scott's system could be improved upon (even allowing for the faulty framework within which it is set) and thereby rendered equivalent to FD2 by strengthening I2 to

I2'. $\sim E!t \supset. a^* = t$.

For then the missing case 3 goes through without the assumption that the terms involved are descriptions. System SS gives a separate role to descriptions which do not refer, a role that may also be taken however by other singular terms, which may be said simply to stand in for descriptions, e.g. 'Pegasus' for 'the pegasiser'. The anomaly is removed by the strengthening. It thereby becomes evident also that what is missing from Scott's system is the principle, connecting terms and descriptions,

TD. $t = \iota x(x = t)$ -

in cases where neither t nor $\iota x(x = t)$ exists. There are again 3 cases to consider:-

Case 1. $E!t$. Then by I1, taking A as $x = t$, $t = \iota x(x = t) \equiv (\forall t)(x = t \equiv. x = t)$, whence TD.

Case 2. $E!\iota x(x = t)$. By I1 again, using the existence-restricted CP, $A(\iota xA)$, $\iota x(x = t) = t$.

Case 3. $\sim E!t \ \& \sim E!\iota x(x = t)$. By I2 and I2', $t = a^* = \iota x(x = t)$.

Hence TD is a theorem of FD2; but it is not valid for SS, a further black mark against SS.

(end of footnote.)

descriptions, i.e. those where an existentially unique entity satisfies the descriptive phrase, are (by FDL) precisely those descriptions whose values exist, and all remaining improper descriptions are identified with a^* (and assigned, on Scott's theory, the null entity). Thus Scott's theory yields both Carnap's scheme, the nonentity collapsing scheme F2 for descriptions, and other disasters.

According to Scott (67, p.187)

> one important reason for insisting that improper descriptions all assume the same improper value is to have this highly useful law of extensionality:
>
> $\models (\forall x)(A \equiv B) \supset. \iota xA = \iota xB$
>
> This would not be valid if one wanted 'the golden mountain' and 'the round square' to have different values. While making unkind remarks about 'the golden mountain', Russell also rejected this law of extensionality, which this author considers an unfortunate choice.

Russell was right of course. Scott's theory fails badly on intensional discourse, but not merely there. The golden mountain and the round square are not identical, since one is golden and a mountain and the other not, but $(\forall x)$(x is a golden mountain $\equiv$ x is a round square) is vacuously true;[1] hence the extensionality principle is false. That it identifies all nonentities is the most serious error in this principle's ways, but not the only one: it also identifies all analytically described objects, e.g. $\iota x(x = x)$ and $\iota x(xE \vee \sim xE)$, and all impossibly described objects, e.g. $\iota x(x \neq x)$ and $\iota x(\sim xr \& xr)$. For the purposes of assessing intensional or inexistential reasoning the principle is obviously hopeless. There are also then, as usual, two ways of repairing the extensionality principle, both of which require substantial enlargement of free logic, and the second of which means transgressing free logic motivational principles. The first is to strengthen the biconditional in the antecedent, not just to strict strength but to coentailment strength; the second is to expand the range of the quantifier to encompass nonentities. The two ways can be independently pursued (as the separation of recent work on entailment from that on the theory of objects indicates), but in a really satisfactory theory the two ways would be fused.

The second way, the important way for a theory of objects, Lambert fails to discern when he considers (in 76, p.252) how a self-respecting Meinongian would repair the following neutral variant on the principle of extensionality:

IP*. $(x)(A!x \equiv B!x) \equiv. \iota yA(y) = \iota yB(y)$,

where $A!x =_{Df} A(x) \& (z)(A(z) \supset. z = x)$, which Lambert contends

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[1] Provided, we count out such mountains as Mont D'Or in New Caledonia.

> at least purports to be a standard discriminating a particular kind of entity, viz. object a. Unfortunately, though it can be consistently conjoined with the key theses of Meinong's theory, it limits impossible objects to one. (p.252)

Although the limitation, to one nonentity, does follow when IP^* is rewritten with existentially-loaded quantifiers, it does not follow when the principle is expressed neutrally (but Lambert's intended reading is neutral: see 74, p.311). For consider the (pure) rounded square and the (pure) golden mountain; the first is round and is square, the second golden and a mountain, and that is all (Parsons' model 74 furnishes such pure objects). Since the (pure) round square is actually round and square but the (pure) golden mountain is not round and square, by IP', the (pure) round square $\neq$ the (pure) golden mountain. In short, IP^* itself - like a neutralised principle of extensionality, $(x)(A \equiv B) \supset. \iota xA = \iota xB$ - will serve (within wide limits) for an extensional theory of objects. Lambert, observing only the first intensional way of repairing extensionality principles, wonders whether a theory of impossible objects is inevitably intensional?[1] The answer is No. But much of the point of a theory of objects would be removed by restricting it to the extensional.

What is true of the golden mountain differs from what is true of the round square and that from what is true of the number 11 or the Euclidean triangle. In order to account semantically for these differences it is enough to refrain from identifying the objects outside the entity domain with a^*, to avoid Scott's mistake. But going that far, giving more than one nonentity a role in the semantical analysis, is to begin on an appealing slippery slope that leads beyond the confines of free logic. For then there will be a set of nonentities, so a domain of them might as well be included in the semantic modelling, and it will be tempting to generalise and particularise about them at least in the metalanguage - but then why not in the object language also? In fact Scott is already prepared to quantify over a^* in his set-theoretic metalanguage;[2] and nothing stops us in taking this language as an object language in more comprehensive investigations.

The conclusion we can now step to, is this: Just as it is essential to proceed beyond free quantificational logic to neutral logic, so it is essential to go beyond free description theory. Can much be salvaged from free description theory? Abandoning nonentity collapsing postulates such as F2 and I2 is certainly essential. Principle FDL, i.e. Scott's I1, can however be retained, subject to due qualification (see points (1)-(3) above). Moreover some correct principles can be gleaned from FDL by using the translation of free logic into neutral logic, e.g. the existence qualified Characterisation Principle, $(\iota xA)E \supset A(\iota xA)$. But can minimal free description theory be extended to the theory of objects, as Lambert has suggested (in 74), by rewriting FDL with neutral operators to yield a neutral description theory? Definitely not. For one thing, neutralised FDL delivers at once, since $\iota xA = \iota xA$, $A(\iota xA)$, i.e. the unrestricted Characterisation Principle, and therefore engenders inconsistency and triviality. This is hardly, what Lambert tries to make out it is, a problem, since there is no good reason to suppose that neutralised IP is valid,[1] and good reason to think that it is incorrect. Insofar as a neutral description theory is required - even when the reductionist pressures underlying usual demands for quantificational elimination of descriptions have been neutralised a residue theory is still required, e.g. to undertake the sort of work IP* attempts to do - neutralised FDL is a bad direction in which to seek such a theory. Neutral logic can indicate a much better direction. A key question is this (cf. Lambert's question, 74, p.311): which object does a description xA(x) select. If some object a satisfies A(x) and just one object in the indicated context satisfies A(x), then in the given context xA(x) picks out that object a (i.e., in effect, a qualified neutral version of the nondamaging half of IP is validated). Since the need for scoping has been removed (along with the Reference Theory), the one problem remaining, which parallels the problem of choice of a standard theory of descriptions, is to determine whether $\iota xA(x)$ selects an object and, if it does, what it selects when the conditions are not satisfied. There are many options, among which leaving things unspecified or undefined is a poor one logically (for reasons of Carnap and Scott already alluded to) and linguistically. But for the present it can be left open how the choice is to be made (the issue is taken up again in §22, where a fairly natural choice is made, and investigated). What is important for the present negatively-oriented discussion is that a description is like a proper name in making a contextually-controlled selection, but the selection is also governed by properties given in the description.

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[1] What Lambert in fact says is: 'It would be a valuable philosophical discovery to be shown that the aversion to impossible objects goes hand in hand with the aversion to intensions'. Would it? The aversions are not constantly conjoined, an aversion to impossible objects not materially implying an aversion to intensions. And while all past and present philosophers with an aversion to intensions do appear to have had an aversion to impossible objects, the connection is merely accidental. It is not too difficult to envisage an extensional philosopher equipped with a rudimentary theory of objects which he peddles: with very little adjustment some of Lesniewski's disciples would fill the bill.

[2] See the suggestions for interpreting a^*, e.g. as the set of all sets belonging to A which are non-self-members, p.184. An appeal to the difference assumed between sets and individuals would not evade the general point for long.

While the experimental theories of descriptions of the free logicians have had comparatively little impact and have certainly not supplanted Russell's theory, the new theories of proper names have had substantial coverage in the philosophical press and are widely thought to have superseded Russell's theory of logically proper names. In part, however, the impression of supersession is wishful thinking; it is just that few are prepared to return to logically proper names,[2] and thence to logical atomism - though that is where classical logic leads. The idea that it does not has been gained by compartmentalisation, by setting aside more highly intensional discourse as too hard, for a later stage, to be handled differently (e.g., as epistemic), etc.

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[1] See the argument of Routley 76.

[2] There are isolated exceptions: Prior was one (e.g. 62), Cresswell 73 may be another.

1.14 THE CAUSAL THEORY OF PROPER NAMES INTRODUCED

The main new theory of proper names, centered on the causal theory (also called 'the historical explanation view' and 'the genetic view'), has various forms, the forms varying with the authorship, and the authorship being drawn from an all-star American cast including Kaplan, Kripke, Putnam, Donnellan, Vendler, and others. But whatever the form the theory takes, it is supposed to supplement classical logical theory, perhaps combined with modalities, by a theory of ordinary proper names. The causal theory - set within the framework of the Reference Theory and its associated logics, classical logic and essentialist modal extensions thereof - is intended to provide an alternative theory of (proper) names, to graft onto the (modally enlarged) classical scheme of things, not just to Russell's theory, but to Frege's and to the theories proposed by their successors, such as Wittgenstein and Searle. The theory is intended to give an account, firstly, of what distinguishes ordinary proper names from other singular terms, and, secondly, of the semantic role of these proper names, in particular, how their reference is determined, a question to be answered partly in terms of their historical genesis. But the causal theory as commonly presented is not merely set within the framework of the Reference Theory, rather (so it will become apparent) it incorporates the main assumptions of that Theory, and thus becomes an obstacle to any theory of objects; and insofar as it cannot be freed from these assumptions it will have to be discarded. (This is not to exclude other grounds for discarding, or modifying, the theory.) But, as it happens, Kripke's causal theory, in contrast to some of the other causal theories, is readily freed from referential assumptions, and could, in modified form, be combined with a theory of objects. The causal theory, although a central part of the new accounts of proper names, is by no means the whole story that is told; the causal theory is surrounded by other theories designed to protect it or supplement it, e.g. theories of rigid designators, and theories of various sorts of names, such as genuine names, vivid names, empty names and even general names. It will pay to pick off some of the surrounding defence before assaulting the causal theory.

The Reference Theory underlies almost all modern accounts of proper names and of reference, and so its removal does extensive damage to those accounts. For example, with its rejection most recent accounts - and not merely those of or associated with causal theories - of what distinguishes names, genuine proper names, from other (singular) subjects fall. Firstly, the idea that such names are exclusively replacement values of variables in quantification logic is wrong, since descriptions and other terms are also legitimate replacements. Similarly defective is the thesis[1] of Quine (70, p.27) that

> What distinguishes a name is that it can stand coherently in the place of a variable, in predication, and will yield true results when used to instantiate true universal quantifications.

If the variables and quantifiers are those of neutral logic, then the situation is as before: descriptions become, on this account, what they are usually not, names. But if the variables and quantifiers are those of classical logic, those of Quine's regimented canonical language, then names are referential and many ordinary names are excluded.[1] Thus all names of what does not exist, or may not exist, are ruled out as names, e.g. Pegasus, Vulcan, Homer. And if Quine's transparency requirements are taken seriously we are back on the royal route to logically proper names.

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[1] Endorsed in Peacocke 75, p.126, and underlying the alternative Kripkean account of names in terms of rigid designators given therein.

Kripke's thesis (in e.g., 72, p.270) that ordinary proper names are rigid designators but descriptions are commonly not, does not serve to distinguish proper names from descriptions, since many descriptions are rigid designators. It does propose a necessary condition on proper names, however, one which is liable to put an investigation of proper names on the wrong track. The same holds for the reformalisation of the thesis in a way independent of the apparatus of possible worlds, as in Peacocke 75. Kripke's thesis makes use of the technical term 'rigid designator' which is explained by Kripke thus (72, p.269): 'Let's call something a rigid designator if in any possible world it designates the same object'. Elsewhere Kripke (e.g. 71) explains the notion more carefully thus: a rigid designator is a term which stands for the same object in every world in which it has designation at all. The more careful explanation looks as if it (properly) admits 'Chiron' and 'Pegasus' as proper names, if those terms stood for objects in Kripke worlds: this would set the account apart from Peacocke's reconstruction of Kripke where ordinary names of nonentities are excluded from among genuine names. But this is not the case: Kripke's quantifiers are referential, his objects, like Peacocke's, transparent entities. On Kripke's view (cf. 73, p.6) it is logically necessary that everything exists; so there are no possible worlds where a centaur exists or Chiron exists - else it would be possible that some centaur exists, conflicting with Kripke's assertion (72, pp.252-4; also 73) that it is not the case that there might have been centaurs (or unicorns). The first account of rigid designator would make everything named by a rigid designator a necessary existent, contradicting Kripke's claim (in 74). But the second account lets through as rigid designators a host of terms that vacuously satisfy the condition, e.g. all names and descriptions of impossible objects; and this would do much damage to other Kripkean views, as will be explained during a detour where some of these views are criticised. A repair which does accord with the Kripkean picture is as follows: a rigid designator is a term which designates the same entity in every possible world in which it has a designation and which has a designation in some possible world. The "repair" appears however to rule out proper names such as 'Sherlock Holmes', so-called 'empty names'; and in any case it will not save the question-begging notion of rigid designator.

The underlying Kripkean picture - in no way obligatory upon those who undertake modal logic semantics, who have other much more satisfactory pictures than either Kripke's or Lewis's open to them[2] - is that the union of the domain of possible worlds consists entirely of entities, and that no domain of a world ever contains a nonentity as an element (i.e. the actual world T controls world domains). Hence, among other things (see especially Kripke 74), the thesis $\Box(x)xE$,[1] and the consequent surprises - mistakes - about Sherlock Holmes and unicorns, e.g. that it is false that Sherlock Holmes might have existed. For the proper name 'Sherlock Holmes' being, since a name, a rigid designator, would have to designate the same entity in every world; but in no Kripke world can it designate an entity without wrongly designating that entity in the actual world where it has no designation; so in no Kripke world does Sherlock Holmes exist, and there it is not possible that he exists. Kripke's earlier view (in 63) - though it included the thesis $\Box(x)xE$, amounting as it did to an S5 modalisation of free logic - was not so restrictive: 'Sherlock Holmes' could

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[1] Much the same goes for Anscombe's point (in 58) that the distinction feature of a proper name is that it contributes to the meaning of a sentence precisely by standing for its bearer. If 'standing for its bearer' is construed widely, so do other terms such as descriptions; but if it is construed narrowly many proper names are ruled out.

[2] The other options include, firstly, worlds semantics which, unlike the Kripke and Lewis options, reject the Reference Theory, and secondly, semantics which eschew worlds, e.g. functional semantics like those of Loparić 77 and Routley-Loparić 78.

> name a possible fictional [object] who doesn't exist in this world ... . That view is false (Kripke 74, p.10).

Kripke's new interpretational impositions (for which no argument is offered, Kripke simply operating within the framework of these assumptions) have no basis in modal theory, as Kripke's earlier work shows. Though ill-founded, the imports are not arbitrary, but are the result of enforcing the Reference Theory, and withdrawing the limited interpretation concessions free logic allows towards nonreferential discourse (e.g. outer domains of nonentities for each world).

The Kripkean picture is thoroughly referential: not only are existence assumptions built in, e.g. through the existential restrictions on objects and the composition of domains just remarked, and, the source of these, the Ontological Assumption accepted;[2] full indiscernibility, like Russell's theory

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[1] Whether free logic thesis $\Box(x)xE$ is true or not depends upon how the quantifier 'for every' is interpreted. If it is construed neutrally or in possibility terms then the thesis is of course false since many objects do not exist. If however it is construed existentially, as, for 'every existing', then the thesis is true, since it amounts to $\Box(Ux)(xE \supset xE)$, which is logically true.

The truth $\Box(\forall x)xE$ should not be confused, as is often pointed out in discussions of Barcan formulae, with the falsehood $(\forall x)\Box xE$. The latter says that whatever exists necessarily exists, i.e. $(Ux)(xE \supset \Box xE)$.

[2] The Ontological Assumption is a pervasive background assumption in Kripke's theorising, which is occasionally spotlighted, especially in the lectures entitled 'Empty Reference' (Kripke 73) and what is said there concerning fictional characters. As a first example, consider statements ordinarily accounted true about nonentities, such as 'Pegasus is a flying horse', 'The Greeks worshipped Zeus' and 'This literary critic admires Desdemona'. According to Kripke,

> The only way to get a grip on this sort of discourse is to ascribe to ordinary language an ontology of fictional characters. This ... is just a feature of ordinary language. The fictional characters whom one must suppose to exist aren't Meinongian half-entities; they are abstract entities ... (73, p.13).

(footnote continued on next page)

of descriptions, also goes unquestioned, in particular all identity statements are necessarily true if true at all.[1] A basic trouble, then, with Kripke's theory, is that it scarcely touches the deeper troubles with classical logical theory. For the modal extensions of classical logic do not seriously affect

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(footnote [2] continued from previous page)

The point is not merely that this is false, in a serious way, statement by statement - though it is - but that Kripke has assumed that in the sense in which fictional statements are true they must be about what exists, i.e. he has automatically applied the Ontological Assumption, and taken it to be, what it is not, a feature of ordinary language. Incidentally, the jibes in 73 about Meinongian half entities and twilight entities indicate his failure to think outside the Ontological Assumption.

The second example derives from Kripke's 'tentative solution' to a problem he of course gets stuck with, negative existentials, how he can truly say that fictional characters do not exist, having rashly allowed that fictional characters do exist. Kripke's proposal is, where a is a fictional character, that 'a is not ϕ' should be more carefully expressed as 'There is no true proposition that a is ϕ':

> the predicate '... exists' will be a limiting case: 'SH doesn't exist' because 'There is no true proposition that SH exists'. Why is there no true proposition? Because SH doesn't exist (73, p.13).

The point is not just that this does not resolve the inconsistency or resolve the problem, given that Sherlock Holmes is an abstract entity with contingent properties including that of existing, and not just that the equivalences do not hold (since, e.g. "SH doesn't exist" is a perfectly respectable proposition), but again that blatant use has been made of the Ontological Assumption; it is assumed that because a does not exist there are no true statements about a, no true statements of the form 'a is not ϕ'.

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[1] Both the full assumption and the special case Kripke tries to insist upon, $(x)(y)(x = y \supset. \Box(x = y))$, have been criticised in detail in §11. But it is worth considering one further argument (due in essentials to V. Routley) against the special case, namely that combined with reasonable assumptions it implies the Leibnitzian thesis that all true statements are necessarily true, a thesis that is false since many true statements are contingent. The argument is as follows:-

1. Every statement (since expressible by a declarative sentence) may be represented in subject-predicate form. There are two parts to this claim: (a) that every declarative sentence can be so expressed, which is really enough for the very damaging result, and (b) that every statement can be expressed by such a sentence. Part of the case for (b), which is threatened by the possibility of inexpressible statements, may be found in NNL. Claim (a) is argued for in Slog, chapter 3, along the following lines: From every declarative sentence a subject can be extracted, the remainder being a predicate. For example, a relational sentence, aRb, may be expressed in the form, af.
2. By a basic transformation from the theory of indefinite descriptions, af iff, as a matter of necessity, a is identical with a thing which is f, i.e. in symbols, $\Box(af \equiv. a = (\kappa y)yf)$. In fact this assumption is classically provable; for classically (e.g. in Russell's theory) $a = (\kappa y)yf$ iff $(\exists z)(a = z \& zf)$, and $\vdash (\exists z)(a = z \& af) \equiv af$.

(footnote [1] continued on next page)

the classical referential picture given that some essentialism is thrown in, all identities are treated as logically necessary when true, names designate none but entities and subjects generally behave referentially, and possible worlds are construed conventionalistically as merely stipulated. In this respect modality is to modern logical theory as weak welfarism of the Welfare State is to modern capitalism - the established doctrine can make minor concessions which are not seen as a threat to the basic structure and can coopt what looked like challenges to its position.

Referential identity assumptions lie behind (what will be considered in reverse order) the causal theory of proper names, the theory of rigid designators, and modern revelations about personal identity - such as, 'No one else could have been Moses' (Kripke, 72, also, p. 3) and 'One cannot imagine Robert Graves born as Claudius or Sigrid Undset living in the Fourteenth Century' (Vendler, 76, p.112). Vendler's argument (which extends Kripke's case) is as simple as its premisses are false:-

1. Statements of nonidentity, if true, are necessarily true (Vendler 76, p.113).

Thus since Graves is distinct from Claudius, he is necessarily distinct from Claudius, i.e. it is (logically) impossible that Graves is identical with Claudius. (In symbols, $x \neq y \supset \Box(x \neq y)$, but by Leibnitz's Lie and S5 principles, $\Box(x \neq y) \equiv {\sim}\Diamond(x = y)$, so $x \neq y \supset {\sim}\Diamond(x = y)$.

2. The impossible cannot be imagined (76, p.112).

Hence, one cannot imagine Graves identical with Claudius or born as Claudius. In place of such carefully selected examples, other examples which count against the thesis should be considered. For example it is perfectly possible for someone who does not know that George Eliot is Mary Ann Evans to imagine or suppose that George Eliot is not Mary Ann Evans but is in fact George Lewes, or for someone to imagine or assume that Vulcan is distinct from Hephaestus or Hercules from Heracles.

Both premisses of Vendler's argument are false;[1] but it is enough to

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[1] (Footnote continued from previous page.)

Now suppose A is a true statement. Then by (1), A is of the form af, so af is true. Hence by (2) $a = (\kappa y)yf)$. So instantiating the special case, $\Box(a = (\kappa y)(yf)$, whence by (2) again $\Box af$, and by (1) again, A is a necessarily true statement.

It may be objected that the instantiation of the special case used is not legitimate. But isn't it? For if af is true, then by referential assumptions a exists, and since aE by transparency $((\kappa y)yf)E$. So free logic conditions for instantiation are met. Thus too Kripke could hardly push this objection very hard given his working modal theory (that of 63).

Indeed given an S5 modal logic (which Kripke rightly accepts for logical necessity) the oft-scorned thesis of traditional rationalism, that no statements are contingent, is derivable. It remains to show (given LEM) that every false statement is necessarily false. Suppose A is false. Thus af is false, so $a \neq (\kappa y)yf$. But, by S5 principles, $\vdash (x, y)(x \neq y \supset. \Box(x \neq y))$. So instantiating (for a free logic proof the further assumption, aE, is required, and the rationalist thesis is accordingly weakened), $\Box(a \neq \kappa y)yf)$, whence $\Box{\sim}af$, and A is necessarily false.

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[1] Counterexamples to premiss 2 and detailed criticism of the premiss may be found in Routley^{2} 75, and centuries earlier, in a splendid passage in Reid: 1895, p. 376 ff.

reject (as was already done in §11) premiss 1, which does quite enough damage on its own. For example, premiss 1 yields at once Kripke's remarkable claim. For the claim is: for no^E x distinct from Moses is it possible that x was Moses, i.e. "regimenting", $(\forall x)(x \neq \text{Moses} \supset. \sim\Diamond(x = \text{Moses}))$, which follows immediately from 1, since Moses exists according to Kripke (see 73).

With the removal of this argument an elaborate structure Vendler erects (in 76) upon it, using the circumstances the argument is supposed to establish, is demolished; in particular, his recreation of the transcendent self, and (with modifications) of the Cartesian cogito, collapses.[1] For example, the key statement 'I am z' (e.g. 'I am Zeno Vendler') can revert to being what Vendler says it looks like but can hardly be, an identity statement; for its truth does not entail that it is necessarily true; it is an extensional identity, its truth depending on its context.

Vendler in fact appeals to Kripke's rigid designator theory to bolster the crucial premiss that identity statements are noncontingent: the procedure is circular, since (as will shortly appear) rigid designator theory in its turn depends on principles like 1. It is not surprising that rigid designation theory can reinforce claims like 1 when it depends on them.

It is assumed in the requirement of sameness of designations from world to world used in the characterisation of rigid designation, that the identity notion is necessary identity. Indeed Kripke can discern no criterion of identity other than necessary identity: contingent identity he rules out, and it is unremarkable that his account of theoretical identity in terms of rigid designators excludes it, since necessary identity is presupposed at the base of the account of rigid designators. For suppose extensional identity is the test. Then every singular term that designates (or on a different approach, none) can be a rigid designator; simply let it designate to what it is about, i.e. $I(t,a) = I(t) = t$. For instance, 'the president of USA in 1970' refers in each world to Preso, i.e. the president of USA in 1970. Why not? With extensional identity, Kripke's argument that (some) descriptions are not rigid designators breaks down. The argument is simply this (Kripke 72, p.270; 71, p.144):- 'The president of US in 1970' designates a certain man, Nixon, but someone else, e.g. Humphrey, might have been president in 1970, i.e. in some possible world the descriptive phrase designates Humphrey, not Nixon. Therefore the descriptive phrase is not rigid, since it designates different entities in different worlds. But does it? On the interpretation given the phrase designates Preso in every possible world. Therefore, since the descriptive phrase 'The president of US in 1970' designates the same object Preso, who happens to be the same as Nixon in the real world, and extensionally identical with Humphrey in some other world, the descriptive phrase is a rigid designator. Thus the notion of rigid designator is seriously unstable without something like a preliminary division of terms which name entities and those which do not, that is, without assumption of the very distinction at issue. In an analogous way it can be shown that names such as 'Nixon' are not rigid designators. For in the actual world 'Nixon' designates Preso but in the world in which Humphrey is president it does not. Similarly for every other name. Again, the notion is unstable (indeed inconsistent), and removing the instability depends upon already having made a distinction between objects and - what amount, on the standard picture, to - individual concepts.

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[1] It is scarcely to the point to document this. But it is important to glimpse the way in which speculative metaphysics may be based on elementary logical principles, often of a referential cast. In this connection it is worth remarking that Vendler's argument is heavily referential, relying not only on the special cases of IIA, but on applications of DA. For instance, he contends, what is essential to his case.

> the nonexistence of ... the thinking, conscious thing as such ... is indeed unthinkable, since that very thought, as any thought, implies its existence (p.117, my rearrangement).

Not so: thinking objects, such as various heathen gods, do not exist.

Peacocke's nonmodal reformulation of the notion of rigid designator may appear to avoid this instability by relativising the notion of rigid designation to languages. It is a matter of appearance only, however, because what is a rigid designator depends not only on the language L but also on what counts as an object, on the range of values of variables, and so on; in brief, in Peacocke's philosophical framework, on the metalogic, meta-L, also. According to Peacocke (75, p.110),

> t is a rigid designator in L iff there is an object x such that for any sentence G(t) in which t occurs, the truth (falsity) condition for G(t) is that <x> satisfy (respectively, fail to satisfy) G( ).

Peacocke, aiming to show off the merits of this account, continues:

> Definite descriptions, in the use of them with which Kripke was concerned when he denied that they are rigid designators, are not rigid designators on this criterion either. There is no object such that the truth-conditions for G(the F) is that that object (or its unit sequence) satisfy G( ).

It is quite unclear what the qualification on the thesis that definite descriptions are not rigid designators is supposed to be. On Kripke's account some descriptions, e.g. 'the square root of 25', are, explicitly, rigid designators (see 71, p.145). Take 'the F' in Peacocke's apparently general claim as 'the square root of 25'; then there is (on Kripke's view) an object, namely 5, which does what no object is said to do. Peacocke's claim is false, and his Russellian arguments for it invalid. Is Peacocke's claim correct for some descriptions? Not without qualifications he does not make. Let language L be an extensional free quantification logic. Then (for a suitable fairly natural choice of metalanguage) it is, as Peacocke himself later remarks (p.116),

> possible to write out a truth theory ... that evaluates definite descriptions directly (as terms), and which contains as theorems sentences of the form $T(G(\iota x)Fx) \equiv <(\iota x)Fx>$ sat[isfie]s $G(\xi_1)$,

i.e. all descriptions are rigid designators in the language. A similar stunt can be pulled off for neutral logics. Peacocke sees this as a "problem" and comments that 'the appropriateness of such truth theories in this particular area can be rejected only on some substantive grounds': it will come as no surprise to the reader that these "substantive grounds" turn out to be grounds drawn from the Reference Theory.

The account is unstable, in a like manner, over which proper names (if any) are rigid designators. For example, on Peacocke's intended referential reading of 'there is an object', names of nonentities in simplified English will not be rigid designators, but on a neutral reading they can be. The account does not show in an unequivocal way that 'proper names are rigid designators in our sense' (p.111). Nor therefore does the notion of rigid designator offer the precision, explicitness and elucidation claimed for it. There is a case then for saying that 'rigid designator' is a piece of technical terminology - perhaps best discarded - which does not do the intended job without taking for granted much that is at issue. A corollary is the undermining of the main applications Kripke makes of rigid designation: especially to contingent identity theories of mental phenomena (e.g. 71, p.161 ff.).

Both Kripke and Peacocke take it as a consequence of the view that proper names are rigid designators that proper names (or at least genuine proper names) are "essentially scopeless". It is a consequence, however, only given further assumptions, in Peacocke's formulation, as to the coincidence of truth conditions (for, as will emerge, truth conditions can be so stated that proper names do have scopes which make a difference). The question of whether proper names have scope can be, and has been, considered independently. And it may be suggested that scope provides another way of distinguishing genuine proper names: they are those (singular) subjects that are scopeless. But the assumption that proper names are scopeless, essentially the idea that they are transparent in all sentence frames, is entirely mistaken: it involves us in most of the problems of logically proper names over again. Saying that proper names have no scope can be put (as Peacocke notes, p.112) by saying that they always have maximum scope, and also that they always have minimum scope: scope does not matter or, in Geach's terms (72, pp.117, 140, 144), genuine proper names give no scope trouble. This implies (indeed is virtually tantamount to saying) that such proper names are entirely transparent. For let 'a' be such a name, e.g. 'Heath' embedded in a frame '$\Phi ... f$', e.g. 'It might have been the case that ... is not prime minister' to take Peacocke's example. The point of the scopelessness claim is that there is no difference in truth-value, and truth conditions, between

1) Concerning Heath: It might have been the case that he is prime minister (or 'it is true of Heath that it might ...'), and

2) It might have been the case that: Heath is not prime minister, or more generally - extending the notation of PM, *14, with '[a]' read 'of a' or 'concerning a' - between

1g) $[a]\Psi af$ and

2g) $\Psi[a]af$.

Now positions of maximum scope are accessible to identity substitution; for the subject is not within the scope of an intensional functor. Suppose a = b, e.g. Heath = Sir Edward. Then by 1g) and replacement $[b]\Psi bf$. Hence, classically $a = b \supset . \Psi[a]af \equiv \Psi[b]bf$, i.e. since scope is immaterial $a = b \supset . \Psi af \equiv \Psi bf$ generally. (The converse connection is more complex and depends on the analysis of terms adopted. For example, on Russell's theory where terms other than names are descriptions it can be shown that scope does not matter where the object described exists and the sentence frame is extensional; see PM, *14.3). It is false that all nonquotational sentence contexts are transparent, and also decidedly liberating to abandon the idea that all are or must be analyzed so that they are (see e.g. §11); hence it is false that genuine proper names are scopeless, and also liberating to abandon the idea that scope is immaterial for proper names. For, among other things, it puts an end to the quest for endless searches for what always turns out to be distorting analyses which only work, at best, for a limited range of cases.[1]

Peacocke has an argument that is worth considering against Dummett's thesis (73, pp.113-7) that distinctions of scope with respect to operators apply to proper names as much as to definite descriptions.[2] It is that on the scoping position

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[1] For a recent example, see e.g. Peacocke's attempt (75, p.126 ff.) to separate in truth-value

3) John believes that Cicero was bald, and

4) John believes that Tully was bald,

Since Cicero = Tully, direct application of his theses would make 3) and 4) inseparable. Peacocke's first response is to reject surface structure sentences, and insist upon regimentation of language, as input to a theory of truth. He then proposes use of Davidson's paratactic analysis of 3) (an analysis rejected in chapter 8 below), in an overtly quotational way which brings 'Cicero' rather than Cicero into the truth-conditions for 3), with the result that 'strictly speaking ... there are no such non-relational propositional attitude sentences [as 3)] containing proper names after all' (p.128). The example illustrates, as Peacocke concludes (p.128)

> a general strategy that it is natural for the defender of the view that names are rigid designators to adopt; that is, of explaining any apparent differences in truth-conditions of surface structure sentences differing only in the occurrences of distinct proper names α and β, where α and β denote the same object, by the difference between the expressions α and β themselves.

It is an old strategy attempted, for example, in many variations by Carnap; for two such see MN, p.54 ff and p.230 ff. Davidson's analysis with Carnap's quotation marks replaced by - what Davidson himself assumes does much the same as quotation - a demonstrative, is simply the latest, clever variation, which does not escape however the old problems for quotational accounts: some of them reappear in the notion of samesaying.

But abandon the transparency thesis and such unsatisfactory reductive strategies are rendered unnecessary.

[2] This is not to endorse Dummett's case for his thesis, in particular the contentious claim that there is

> a clear sense in which we may rightly say, 'St Anne cannot but have been a parent' (73, p.113).

The argument for this appears to involve fallacious substitution of an extensional identity in a modal context; it appears to have as premisses "St. Anne is the mother of Mary" and "The mother of Mary cannot but have been a parent".

> there ought to be a true reading of almost any sentence of the form
>
> α might not have been α ... .
>
> Yet there seems to be no such reading of the sentence for genuine proper names. Worse; in many cases, something other than the thing that is in fact α might [do], and so ... it ought (on one reading of the sentence) be true to say
>
> Something other than the thing that is α might have been α.

Strictly it does follow from the view that *sometimes* scope matters in the case of proper names, that it ever matters in the case of certain contexts, such as the ones cited. However it is not difficult to design cases where it is material even in sentences of the form $\Diamond(\ldots \neq \ldots)$. Consider for example, the true statement

5) It is true of Mary Brown that she might (easily) not have been Mary Brown,

where the story-teller, after explaining how an unforeseen accident one evening changed the course of events, concludes:

6) It is true of Mary Jones that she might have been Mary Brown.

Other possible cases with similar outcome are easily devised (reincarnation, which presumably in some forms at least is *logically* possible, serves as a plentiful, if somewhat esoteric, source).

With the rejection of the thesis that proper names do not really have scope or an equivalent, can go removal of most of the oddities that have emerged from theories of quantified modal logic, e.g. damaging essentialism.

The "scope game" is a technically awkward one carrying many disadvantages (see §12); e.g., even a comparatively simple sentence such as $\Diamond{\sim}(a = a)$ has (at least) 9 construals, each with a more complicated form, and the number exponentiates as more functors are introduced or are exposed in analysis. Fortunately (as we have already seen, again in §11), the scope game is unnecessary. The need for scoping was forced by the Reference Theory, especially (but not only) the Indiscernibility Assumption; and the game can be abandoned when the Theory is no longer retained. What was achieved by scoping can be better achieved without scoping, both in the case of proper names and in the case of descriptions, by a two-fold procedure:-

A) the following of natural language in distinguishing syntactic forms that scoping is sometimes said to be necessary to discern, e.g. the syntactic differences between 1) and 2); and

B) the use of neutral logic, in particular the quantification of IIA and of EG. To put it roughly, the proper *consequences* of scoping, that classical logical principles such as EG and IIA fail, are all that are required to maintain the logical benefits of scoping.

Consider, to illustrate, how 1) and 2) are formulated and differentiated.

2) is symbolised in the expected way

2') $\Diamond h{\sim}PM$

Symbolisation of 1) is less evident, but it is plain that 1) is saying of a thing x which is Heath, that it might have been the case that it, x, is not prime minister; i.e., binding the variable that supplants the pronoun, that, for some x which is Heath, $\Diamond x{\sim}PM$. Since existential loading is supplied by the context, 1) may be represented (using classical restricted variables)

1') $(\exists x)(x = h \;\&\; \Diamond x{\sim}PM)$.

1') and 2') are not equivalent. 2') materially implies 1') since hE and h = h; but 1') does not imply 2') since $\Diamond$ ... ~PM is not transparent. The cases where 'Heath' is replaced by 'the prime minister' are similarly handled; in particular, $(\exists x)(x = \iota PM \;\&\; \Diamond xPM)$ does not imply $\Diamond \iota PM\ PM$. More generally, 1g) and 2g) become respectively (with 'P!x' read 'for some one x such that'),

(1g') $(P!x \supset (x = a))\Psi xf$, and

(2g') Ψaf

Rigid designators can be avoided without the artifice of scope; the notion of scoping can be dispensed with along with that of rigid designation. Further, scoping of descriptions can be dispensed with along with that of proper names; indefinite description are handled as for proper names, but for definite descriptions there is the further vexed question of uniqueness to accommodate. It is fairly clear that no impoverishment results from the method; for every scope distinction of Russell's theory can be matched using the method.

Thus far most of the usually discerned differences between proper names and descriptions have been dismissed; for example, descriptions can be replacement values of variables along with proper names, and can conform fully to neutral quantification principles, descriptions can be rigid designators along with proper names, names can be assigned scope along with descriptions, but really the whole artifice of scoping is best, and easily avoided, and so on. To complete the foray on recent referential theories of proper names - especially those that seem to stand in the way of any theory of nonexistent objects, it remains, to similarly dismiss, or assimilate, the aforementioned causal theory of proper names.

The causal theory - although a recent development and far from clearly articulated or satisfactorily defended - has caught on: it has been easily sold philosophers rightly dissatisfied with former classical options, and has already been applied (as if it were some sort of received truth) in underpinning facets of the Reference Theory and making trouble for theories of objects. So it is of some importance, in meeting objections to theories of objects, to dispose of or neutralise the causal theory. But it is not so easy to get to grips with theory: as Vendler remarks (in 78),

> the causal account, admittedly, is but a cover-story, suggestive and attractive in spite of, perhaps even because of, its vagueness.

Ask a philosopher what the causal theory of reference is and if you succeed in getting an answer it mostly runs something like this: the meaning of a word, or of a name, is given by a causal chain leading from something or other. Firstly, this presupposes an identification of meaning and referring which leading proponents of causal theories (rightly) do not want to make. Donnellan, for example, explicitly presents his theory as a theory of reference (e.g. 74, p.3), and so does Kripke who indeed claims, along with Mill, that proper names have no connotation or sense and, against Mill, that neither do general (or class) names (see e.g. 72, p.327). Secondly, Donnellan prefers to avoid the title 'causal theory', because he wants 'to avoid a seeming commitment to all the links in the referential chain being causal' (74, p.3, note 3). The recipe of the explanation theory thus takes the form: the reference of a (proper) name, on a given occasion of use, is determined by (is a function of) some (explanatory) chain leading from something (in the past). So far (at least if 'reference' is construed in its nontechnical sense, or replaced by the neutral terms 'designation' or 'signification'), the theory is quite compatible with a theory of objects. The designations of 'Homer' and the designation of 'Sherlock Holmes' can both be given in this sort of way: there is an explanatory chain leading from some original sources where the name is introduced to current uses. Similarly, names of nonentities are (as we shall see) admitted, though no doubt unintentionally, under Kripke's account. For proponents of explanation theories - who have given significantly different elaborations of the initial recipe - have usually intended to rule out names of nonentities as fitting under the account they favour. Nowhere is this clearer than with Donnellan, who is in considerable trouble trying to explain how, on his theory, 'N does not exist' is true where N is a proper name of a nonentity (even giving him the ill-defined notion of a "block", 74, p.25, he does not succeed). According to Donnellan's account the chain is one of 'historically correct explanation' and the something in the past is an historically existing individual.[1] Thus, for example, the reference of 'Socrates' in someone's statement "Socrates is snub-nosed"

> is an individual historically related to his use of the name 'Socrates' on this occasion (p.17),

where the 'kind of historical connection' is one of (correct) explanation. Where such an individual does not exist there can be no such historical relation (pp.22-3). Hence Donnellan's problem with negative existentials, and indeed with a great many other commonplace uses of proper names. Is there any good reason why Donnellan's account had to be so narrow, why it cannot be liberalised to admit explanations, for example, of names of nonentities? There is no good reason, as Kripke's account will show, but there is reason of a very familiar sort, namely Donnellan is locked into the Reference Theory. Thus he asserts the Ontological Assumption as if it were entirely uncontroversial (p.6, note 9): 'If Jacob Horn did not exist then there are no true predicative statements to be made about him'. His strong commitment to the principle is revealed, rather incidentally, (74, p.22), by the extraordinary claim that 'in any view we must, I think, accept the following:

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[1] Similarly on Kaplan's "genetic" account (in 68), explained in Vendler 78 thus:

> the particular of [expressing the identifying relation in phrases of the form ' 'a' is the name of x'] requires a genetic account causally linking the acquisition of that representation of the individual itself. Thus a child may have a rich vivid "name" of Santa Claus without its being of anything,

i.e. anything actual. (Vendler's quantifiers are all referentially-loaded.) But ordinarily, and on the account to be given below, that 'a' is the name of x does not entail that x exists; rather that 'a' is the name of x entails that 'a' is about x, i.e., a = x (but not conversely). That x does not exist does not exclude an explanatory linkage connecting name 'a' with x.

The fact of the matter is that both Vendler and Kaplan are, like Donnellan and Kripke and Putnam, locked into (or should it be said, following Armstrong, humed into) the Reference Theory. Without, as will become apparent, both the OA and IIA, the main problems causal theories are supposed to solve, and most of the problems they generate, hardly arise.

> E. that Socrates did not exist entails that it is not true that Socrates was snub-nosed.

Certainly on no theory of objects is E accepted, nor would it be ordinarly accepted. Suppose for example, it was discovered that Socrates was not an historical figure, but a fabrication of several Greek authors acting in concert: we don't thereupon strip Socrates of all his features, as the Ontological Assumption would have us do: Socrates remains the Greek philosopher, the main figure of Plato's dialogues, snub-nosed, bald, etc., even though he never did exist. The Indiscernibility Assumption plays an even larger, if more covert rule, in Donnellan's presentation.

The problem the historical explanation theory of ordinary proper names tries to answer only arises within a Leibnitzian setting.[1] The problem is: 'How is the referent of a proper name to be determined [... given that not all proper names have] a backing of descriptions that serves to pick out this referent?' (Donnellan 74, p.14).[2] In setting up the problem in this way, however, equations are made, which, though they hold given full indiscernibility, break down when extensional and intensional identity criteria are properly separated. For example, Donnellan assumes that the thesis that proper names have a backing of descriptions that serve to pick out their references - which is equated with the thesis that 'a referent of a proper name is determined by correctly associated descriptions' (p.14) - is the same as the thesis that 'ordinary proper names are like Russell's "genuine" names at least in so far as they do not conceal descriptions' (p.14) and that proper names are 'by one mechanism or another surrogates for descriptions' (p.13). Without full indiscernibility, these are rather different theses. For then, where 'a' is a proper name and 'd' a description, a can be contingently identified with d, without a's being a concealed description of d, i.e. Leibnitz-identical with d, or a surrogate in this sense for d.[1] Nonetheless though a is not a description and in many contexts of its occurrence cannot be replaced by descriptions (i.e. in highly intensional frames), nonetheless 'd' or another description can serve to determine the referent of 'a'; for this, like identifying reference, is a matter of extensional identity, and statements of such forms as 'a = d' which are not intensionally embedded suffice to give the referent.

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[1] The point holds good not merely with respect to Donnellan's motivation, but in the case of variant causal theories as well. Consider, for example, the way Vendler, in 78, introduces the causal theory 'to account for the identificatory power of certain "names" ..., including some, or most, singular terms'. The problem is: how does 'the city I spent last year in', said by Strawson, mean (i.e. in this sense, identify or pick out) Chicago (even for Strawson)? As Vendler remarks, it is surely not a matter of the meaning of the descriptive phrase, nor can it be given by (what is closely related to sense) Leibnitz-identity or by strict identity. But Vendler discerns no identity determinate weaker than strict (as we saw above), so he cannot adopt (and, unsurprisingly, does not even consider) the obvious answer, namely that, in the context specified, the city I spent last year in is contingently identical with Chicago. No causal account is required to explain the matter. An important aspect of the identificatory power of a singular term 'a' is that it can be used to identify, contingently, in a way that depends on context.

[2] The problem is alternatively formulated thus (p.16):

> But if the principle of identifying descriptions is false, what then is the appropriate relation between an act of using a name and some object such that the name was used to refer to that object?

The conflation of identity criteria is already built into the principle Donnellan is especially concerned to reject (see his 72), the principle of identifying descriptions.

The way Donnellan formulates the problem the historical explanation theory is intended to answer is in fact thoroughly within the confines of the Reference Theory. This is evident from the account he offers of the truth conditions for statements of the form 'N is ϕ' where 'N' is a name and 'ϕ' a predicate.

> Putting existence statements aside, ... we can say that in general the truth conditions will have the following form. What the speaker has said will be true if and only if (a) there is some entity related in the appropriate way to his use of "N" in this sentence - that is, he has referred to some entity, and (b) that entity has the property designated ϕ. (I say "in general" because there are difficulties for any theory of reference about uses of names for fictional characters, "formal" objects such as numbers, and so forth.)(74, p.15)

The Ontological Assumption is thus written into the statement of truth conditions for 'N is ϕ', and the result is that the statement has to be hedged around by qualifications strongly reminiscent of those in Russell (e.g. 'putting existence statements aside' - but much more has again to be put aside, e.g. all ontic predicates; 'in general', because the account fails wherever the Ontological Assumption is countered). But the truth conditions for "N is ϕ" can be stated quite generally, in a way which avoids the Ontological Assumption and thereby avoids the difficulties Donnellan quite mistakenly says there are for any theory of reference; namely

"N is ϕ" is true iff the item 'N' is about has the property $\lambda\phi$.

The problem of finding an entity appropriately related to the use of 'N'

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[1] Similarly, though the story is more complicated, where proper names are logically correlated with sets of descriptions, as on Searle's account, 58 and 68; cf. also Wittgenstein 53, §79. The connection of the object named with what each element of the correlated set is about is one of extensional identity; it is not a Leibnitz-identity nor (differently) are the terms synonymous.

The logical connections made have, then, comparatively little in common with Searle's theory, as exposed and criticised in Kripke 72. For Searle's theory is thoroughly and objectionably referential. On the ontological front Searle goes so far (in 69, e.g. p.77) to impose an axiom of existence, according to which, if an object does not exist, then we cannot, in any good sense, refer to it.

Wittgenstein, despite his opposition to the Referential Theory (though usually in a narrower sense) never completely escaped from the confines of that pernicious theory.

('some relation between the speech act involving the name 'N' and an object in the world', p.17) disappears: the historical explanation account becomes otiose. Of course historical explanation remains important in what is different - explaining the origin and history of a name (and what these in turn explain).

The truth conditions have to be (erroneously) contracted to referential ones for the historical explanation theory to have a point or any real chance of success. For

> the central idea is that this [the reference of the subject in 'Socrates was snub-nosed'] calls for a historical explanation; we search ... for an individual historically related to his use of the name "Socrates" on this occasion (p.16).

The central idea is inapplicable to any names but those that refer to individuals that exist or did exist. The intended historical explanation relation, like the causal chain relation, rules out (at least prima facie) all reference to objects that do not yet exist or that never exist. Historical inquiries are not to the point with respect to future objects (and causation would have to be reversed), and will not reveal any appropriate details of causal chains commencing with the objects that do not exist. For - so it is usually claimed[1] - nonentities cannot occur as elements in causal chains linked to entities; e.g. a is causal ancestor of b and b exists implies that a exists or did exist.[2] Hence the limitation on "genuine" names to suitably referential ones. This unwarranted limitation on names can however be removed, if the restriction, that chains must begin with objects that exist or have existed, is removed. Donnellan provides no serious case for imposing this restriction in the first place, and in fact the restriction is removed on Kripke's account.

A rough statement of Kripke's theory of (proper) names is as follows:

> An initial baptism takes place. Here the object may be named by ostension, or the reference of the name may be fixed by a description (Kripke 72, p.302)
>
> ... or in some other way. ... Subsequent speakers use the name with the intention that it shall have the same reference with which it was originally endowed. Later still yet other speakers pick up the use of the name; and they enlarge it with the intention that it shall have the same reference as it had in the mouths of those from who they learned it. This process continues, and so the use of the name is passed from link to link of a chain of communication: what joins each link to the next is its causal connection with it, together with the persistent intention to use the name with the same reference as the previous speaker (Dummett 73, pp.147-8).

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[1] The claim is appealing as long as one is held captive by a narrow range of models, e.g. of causation as always involving Brentano-style relations. But causation is not so restricted; recall psycho-physical relations and converses, e.g. the thought of seeing Helmut caused her heart to beat faster.

[2] Such conditions are apparently violated on Parsons' theory 74, where it can be true, e.g. that a caused-the-death-of b, b exists and a does not. Parsons would probably say that the conditions hold for relations, whereas the truths his theory admits only ascribe properties.

There is nothing in this that does not fit names of nonentities as well as names of entities, given that the initial baptism (more precisely, initial naming) can be conducted in the absence of the object named, as it can (see Kripke's example of the naming of Neptune, 72, notes 33 and 42, and compare it with the naming of Vulcan).[1] Consider the name 'NN' of a character from some work of fiction. The author of the work names the character and fixes the reference (in the colloquial sense) by his work, or he may do so by descriptions. Then use of a name may be passed from speaker to speaker in a chain of communications in exactly the way Dummett has indicated. Whatever the precise linkage is in the case of names of entities it is the same for names of nonentities; for it is with names of objects that have actually been named (whether existent or not) that the account deals, and names of nonentities have the same status as names of entities.[2]

Thus, for what it is worth, Kripke's causal account caters for names of objects which do not exist.[3] A causal theory is no bar to a theory of objects. It is, however, somewhat unclear just what the account is an account of, or, accordingly, what it is worth (cf. Dummett 73, p.146, 148). It looks as if it is intended, like other causal theories, as an explication of when a name names, or refers to, or identifies an object (or of when a speaker who uses the name does, or succeeds in doing, these things). But, firstly, that Kripke's account succeeds, looks very doubtful (there is uncertainty because the outline is insufficiently clear at critical points). As Kripke's account stands, it seems, on the one hand, that a name could name an object though not all requirements on linkage are met, and on the other hand, that the conditions of the account can be met without the name naming the given object, e.g. because of unwitting transfer of a reference, because despite intentions, of a misunderstanding (Dummett has a nice example, 73, p.150). Secondly the account is circular; as Kripke points out (72, p.302) it appeals to the notion of reference at two points in explaining reference.

Once the Reference Theory is seen through there is nothing to stop us reverting to essentially what Donnellan calls the natural (pretheoretical) view of singular terms such as ordinary proper names:

> ... prior to theory the natural view is that [such singular terms] occur often in ordinary speech. So if one says, for example 'Socrates is snub-nosed' the natural view seems to me to be that the singular expression 'Socrates' is simply a device used by the speaker to pick out what he wants to talk about while the rest of the sentence expresses what property he wishes to attribute to

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[1] But various of Kripke's accompanying remarks fail. For example, it is doubtful that 'usually a baptizer is acquainted in some sense with the object he names and is able to name it ostensively' (72, p.349). Just consider a productive novelist.

[2] Just as the causal or historical theory can be redone neutrally, in helping account for the identificatory power of certain singular terms, so recent theories of communication, such as Grice's 68, can be recast neutrally to allow for communication about objects that do not exist.

[3] Without adjustment of the account in fact given. Of course if someone should try to write more into baptism than Kripke does in 72, then minor adjustments may be required.

> that individual. This can be made somewhat more precise by saying, first, that the natural view is that in using such simple sentences containing singular terms we are not saying something general about the world - that is, not saying something that would be correctly analysed with the aid of quantifiers; and, second, that in such cases the speaker could, in all probability, have said the same thing, expressed the same proposition, with the aid of other and different singular expressions, so long as they are being used to refer to the same individual.[1] (74, p.11)

Donnellan rejects what he now calls the "natural" view because it generates one of Russell's budget of paradoxes, in fact Russell's puzzle (3): how can a nonentity be the subject of a proposition?[2]

> If I say, 'Socrates is snub-nosed', the proposition I express is represented as containing Socrates. If I say, instead, 'Jacob Horn does not exist', the "natural" view seems to lead to the unwonted conclusion that even if what I say is true, Jacob Horn, though nonexistent, must have some reality. Else what proposition am I expressing? The "natural" view thus seems to land us with the Meinongian population explosion. (p.12)

This is just the "riddle of non-being" over again: the problem is dissolved (as explained in §4 ff.) with removal of the Ontological Assumption. That a true statement is about Jacob Horn, or that a property such as nonexistence is correctly ascribed to Jacob Horn, does not imply that Jacob Horn has some reality. And the proposition expressed may be represented in the same way Donnellan represents 'Socrates is snub-nosed': what parallels <Socrates, λx x is snub-nosed> is <Jacob Horn, $\lambda x \sim xE$>, which contains Jacob Horn as first component in the same way as the example contains Socrates. As has been said repeatedly (and is said again in a little more detail in chapter 5, §1) this leads to no population explosion: to suppose that a theory of objects causes a population explosion is to suppose that the objects somehow exist, e.g. have reality. The population explosion metaphor relies upon mistaken referential assumptions.

To elaborate upon the natural view:- proper names are selectors, they select a single object, a particular, not from the domain of particulars but from a sub-class thereof indicated by the context. For example, in the context of Donnellan's paper 'Socrates' and 'Aristotle' select Greek philosophers, but in another context, e.g. where in a discussion of modern Greek transport it is said 'Aristotle sold his airline', 'Aristotle' selects not the Philosopher but Aristotle Onassis.

Specifically, for each proper name 'a', and indeed for each singular term, occurring in a slab of discourse, the context of its occurrence delimits with more or more often less precision, a class γ_a and a selects, or singles out a particular of γ_a. For instance, in the utterance 'Bill can't go out because he hasn't finished his homework' in an obvious context the class consists of members of the immediate family just one of whom is Bill, and in that context 'Bill' selects, and signifies, that object. The remainder of the sentence does of course ascribe a property to the object selected, namely the property λx (x can't go out because x hasn't finished x's homework). And the statement expressed is the same as would have been expressed had the speaker ascribed the property to Bill Mathews or to "my son" (the sameness-of-statement relation is that discussed in §12). The account is plainly not limited to objects that now exist or have existed or sometime exist: it applies equally well to proper names that signify objects that never do or never can exist. Thus 'Primecharlie' selects, in the context of this book, an impossible object from the class of objects obtained by number-theoretic operations on the natural numbers; 'Chiron' in suitable contexts selects an exceptional centaur.

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[1] But Donnellan's attempt to represent the natural view more formally (pp.11-12) works not at all unless more fully expressed and then only for elementary sentences.

[2] Donnellan suggests that the natural view generates all of 'Russell's budget of paradoxes'. But as we have seen, and as is summed up at the end of §22, the natural view generates such puzzles only when combined with the Reference Theory. Abandon the latter theory and the natural view encounters no such puzzles.

Singular descriptions function in a similar way except that characteristically there are different constraints on how the selection is made. Consider 'the red headed man' or 'the golden mountain'. As well as the context, the common terms 'red-headed man' and 'golden mountain' control the selection, which is, in addition, made differently. For example 'the red-headed man' is selected from the restriction of the class of persons in the indicated neighbourhood, i.e. the class indicated by the context, to red-headed male elements. In immediately successful signification, just one object is in the restricted class and 'the red-headed man' selects that object. The selection is not given in advance as happens with many proper names. Such descriptors as 'a', 'an arbitrary', 'a certain' similarly differ in how the selection is made from the class marked out by the context and the descriptive phrase.

But really there is no sharp line to be drawn between ordinary proper names and descriptions.[1] The gulf between proper names and descriptions that is an integral part of classical logical theory, and is retained in recent accounts of proper names, is an illusion. Names and descriptions merge into one another, through composite names that have a clear enough sense, such as "The Alpine Way', 'The Old Grange', '(The) Treefern Walk', 'Tall Trees', 'Lyrebird Lookout', 'Superman'. For example, 'The Alpine Way' belongs to the overlap; it is both a name and functions like a definite description of an Australian highcountry road. Many older names retain a descriptive component, e.g. 'William of Sherwood', 'Peter of Spain' (alternatively 'Petrus Hispanicus', which has a fully descriptive construal), and it is well-known that etymologically most names originated as, or abbreviated, descriptions.

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[1] Though various, usually fuzzy but sometimes important, boundaries can be drawn; e.g., between descriptions, descriptive proper names, pure proper names, and variable names.

Corresponding to the gradation of proper names from those which include operational descriptive components to those which are not so composite, is a gradation of names from those with distinctive sense through those with a residue of sense to those with a minimum of sense (obtained, e.g., in virtue of their role as placeholders, which resembles that of constants in logic). The latter type pure proper names which carry no descriptive loading (apart from perhaps an inessential etymological component), might well be called Millian proper names. Mill and Kripke say that these proper names have no connotation or sense; but whether they have some, or zero sense, or a minimal sense, depends on how the theory of sense adopted settles matters in this borderline case.

Although names merge into descriptions, the ends of the spectrum are very different. To be sure, a subclass of proper names, pure names, which have no live descriptive force can be distinguished, along rough syntactical lines as follows: they are not complex expressions like descriptions and contain no descriptive phrases or general terms, but consist of one or more names which do not admit of further syntactical (or semantical) analysis in terms of their part. Pure names properly include logically proper names. Most ordinary Christian names, for instance, of objects, living or dead, present or future, existent or nonexistent, are pure names, though not logically proper names.

A better distinguishing characteristic for names and descriptions is lack of assumptibility; conventionalised names are no longer assumptible, and their bearers cannot be assumed to have the features the name specifies: Thus Reedy Creek (so called because it once had reeds), since it was polluted and subjected to "stream improvement", no longer carries reeds, or indeed any life at all, and even its status as a creek as opposed to a drain is in doubt. Similarly the lyrebirds may long have gone from Lyrebird Lookout, and one cannot safely assume that Bridge St. leads to the bridge (which has been dismantled). Thus unlike the other theories, the theory of objects can explain, through loss of assumptibility, such important features of names as their evolution from descriptions, their conventional character, and why conventionalised names are poor in entailments and tend to yield no necessary statement other than such logical ones as self-identity. The spectrum - a spectrum of descriptiveness vs. conventionality - occurs in terms of the degree to which the item's name is severed from the stem's properties.

But for the theory of objects a fuller-blown theory of proper names is hardly required, and in one respect would be undesirable, in as much as a more specific limiting account would close options for theories of objects that are better left open. It is enough that a range of proper names, including ordinary names of objects that do not exist, can occur as singular terms in the logic, as genuine subjects of true statements. The narrow historical view was an impediment to the satisfactory implementation of this requirement, serving as it did to reinforce the Ontological Assumption: clearing the narrow view out of the way accordingly had some real point. The wider causal theory of names need not conflict, however, with the theory of items, and, for what it is worth, the wider theory can be incorporated into the theory of items. It has, after all, a role in explaining how the selection of object that a name in use makes was originally made, and in this fashion too it can help in determining what the name signifies.

There is no problem in explaining what the reference of a name is, without appeal either to the causal theory or to a notion of sense: the reference of 'a', if 'a' has a reference, is any entity b, which may be picked out by a description 'b', such that b = a (with the identity extensional), and 'a' has a reference iff $(\exists b)(b = a)$, i.e. iff a exists.[1] But, so it will emerge, reference, like sense is a derivative, not a fundamental, semantical notion. The basic semantical notion is interpretation, which is world and context relativised. The interpretation, or signification, of a proper name at a world and in a context is always an object, what in that case the name is about, i.e. what it selects.

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[1] Reference of a name can be determined without appeal to, or knowledge of sense of the name. Thus Dummett's assertion (13, p.143) that sense is 'the only mechanism by which a name could acquire reference', is just false. Granted the assertion is (analytically) true in one of Dummett's idiosyncratic senses of 'sense', but these senses, which fail to coincide, diverge rather sharply from the ordinarily understood notions.

IV. Stages of logical reconstruction: evolution of an intensional logic of items, with some applications en route

The approach adopted in the logical development of the theory of items that follows is an evolutionary one. Logical horizons are widened stage by stage in the ascent towards more adequate logics fit for the theory of objects. There are several reasons for this approach. One is to reduce problems so that fewer (parts of) problems need be met at a time, and so that the reasons for meeting them in a given way are better articulated. Another is that options are better revealed in this way: there are many degrees (and directions) of departure from orthodoxy where one can rest, with lesser or greater comfort. Yet another is that many details of the latest stages of evolution are not entirely clear (and sometimes, to be honest, far from clear). Things are still being worked out: this is especially so in the higher reaches of relevantly-based intensional logic. But, obviously, once the stages are elaborated and the reasons for advancing from one stage to the next accepted, the logical revolutionary can leap directly to, or beyond, the latest stage.

§15. *The initial stage: sentential and zero-order logics.* Classical sentential logic S is correct, for the regimented extensional connectives it includes, for a class of important, classical, contexts: it is not universally correct. It fails, badly (as RLR explains), in nontrivial inconsistent situations (where there are in effect truth-value gluts), and it is in doubt in incomplete situations (where there are truth-value gaps). Nor does it cater for nonsignificance (as Slog explains). However the doubts may be assauged by adjusting the semantics of the logic, e.g. by adopting supervaluational semantics or superior alternatives, and the failures may be avoided by reinterpreting the connectives and restricting the applications of the rules of inference of the logic. Alternatively, but a little less satisfactorily, the application of the logic could be specifically restricted. With these strategies the syntactical structure of logic S remains substantially intact.

The well-formed formulae (wff) of S may be constructed, in accord with usual recursion clauses for connectives, from the following components:-

initial wff	sentential parameters:	$p, q, r, p', q', r', p'', \ldots$
	sentential constants : (including connectives)	$p_0, q_0, r_0, p_1, \ldots$
improper symbols (including connectives):		(,), &('and'), ~('it is not the case that').

Further connectives are defined in familiar fashion (using familiar extra-systemic notation, e.g. that of RLR):

$$A \vee B =_{Df} \sim(\sim A \,\&\, \sim B); \quad A \supset B =_{Df} \sim(A \,\&\, \sim B). \quad A \equiv B =_{Df} (A \supset B) \,\&\, (B \supset A).$$

S may be axiomatised schematically as follows (the bracketing conventions are standard: see, e.g., RLR):

S1. $A \supset. A \,\&\, A$ S2. $A \,\&\, B \supset A$

S3. $A \supset B \supset. \sim(B \,\&\, C) \supset \sim(C \,\&\, A)$

RMD. Where A and $A \supset B$ are theorems of S so is B, i.e. in symbols:
$A, A \supset B \rightarrow B$ (Material Detachment).

The axiomatisation is essentially that of Rosser 46. But the rule is an *admissible* rule only; it applies to the theorems of S, but *not* generally, so avoiding the objections (made in RLR) to an unrestricted rule (γ) of Material Detachment. Despite appearances perhaps, the statement of RMD is not circular, for theoremhood may be independently defined, e.g. as follows:-
A is a *theorem of* S iff in some sequence $A_1, \ldots, A_n$ of wff of S every element A_i $(1 \leqslant i \leqslant n)$ is either an instance of schemes S1–S3 or is preceded in the sequence by wff of the form A_h (with $h < i$) and $A_h \supset A_i$, and $A = A_n$.

If the standard two valued semantics for S is retained then the application of S has to be restricted to exclude nonsignificant assertions (and perhaps incomplete assertions). To explain all this briefly:- A (*standard*) *model* $\underset{\sim}{M}$ for S is a structure $\underset{\sim}{M} = \langle T, I \rangle$ where T is an element (understood as the factual world, or reality) and I is an interpretation function which assigns to each initial wff at T one of the holding values 1 or 0, i.e. $I(A, T) = 1$ or $= 0$, but not both, for each sentential parameter or constant A. The interpretation is extended from initial wff to all wff by truth-table prescriptions thus:

$$I(A \,\&\, B, T) = 1 \text{ iff } I(A, T) = 1 \text{ and } I(B, T) = 1;$$

$$I({\sim}A, T) = 1 \quad \text{iff } I(A, T) \neq 1.$$

$I(A, T) = 1$ may be read: A *holds at* T, or A is (switched) on at T; or on a different construal of T, as: A is in T. Truth is defined in terms of holding, thus: A is *true in* $\underset{\sim}{M}$ iff $I(A, T) = 1$; and validity is simply truth in every model, i.e. wff A is S-*valid* or classically valid iff A is true in every model $\underset{\sim}{M}$ for S. It is evident that T is otiose and that a model for S can be simplified to an interpretation. The point of introducing T is to prepare the way for the transition to worlds semantics to cater for intensional operators, to bring out the one-world assumption of classical logic, and to introduce, in a preliminary way, the definition of truth which will be adopted, that of truth as holding at T. Familiar arguments show that a wff A is a theorem of S iff A is S-valid. Thus too, a little argument shows, truth-tables provide a decision procedure for S. Accordingly also such principles as LEM, $A \vee {\sim}A$, and Addition, $A \supset. A \vee B$, are theorems of S, since they are valid by truth-tables.

The interpretational troubles begin, of course, with such theorems. If p_0 is a nonsignificant assertion such as "The colour of 5 o'clock is green, not orange" or, more philosophically perplexing, "The duration of 5 o'clock is 10 minutes", then p_0 is neither true nor false, so $p_0 \vee {\sim}p_0$ fails to be true, and even if A is true $A \vee p_0$ is not. There are two (connected) ways of dealing with this problem which leave the calculus S unscathed. The first, the falsidal, strategy is to map all elementary nonsignificance into falsehood, i.e. if an *initial* wff such as p_0 would intuitively be assigned value nonsignificant then assign the wff value false, i.e. 0 at T; and otherwise extend I as before. The falsidal strategy, which has the advantage that the formal semantics is unmodified, runs into interpretational difficulties with natural language negation (as in 'The number 7 dislikes dancing' which is just as absurd as 'the number 7 likes dancing')[1] and fails to provide a satisfying theory of nonsignificance. (It is, as Slog) tries to explain, a strategy for trying to dispose of difficulties without examination, rather than an account of nonsignificance which gets to grips with the preanalytic data). Also the apparent simplicity of the falsidal mapping vanishes outside artificial languages where the class of atomic wff is not clearly articulated (because what is primitive and what counts as defined is not effectively determined).

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[1] See Brady-Routley 73 and Routley 69.

The second strategy, the reinterpretation strategy, reinterprets wff of S over three values, 1, 0 and n (for nonsignificance). That is, I assigns each initial wff A exactly one of the three values, 1, 0, n. I is extended to all wff by the following rules (where for simplicity & is replaced as primitive by ⊃ in terms of which & is defined thus: $A \& B =_{Df} \sim(A \supset \sim B)$):

$I(A \supset B, T) = I(B, T)$ if $I(A, T) = 1$, and

$I(A \supset B, T) = 1$ if $I(A, T) \neq 1$;

$I(\sim A, T) = 0$ iff $I(A, T) = 1$, and

$I(\sim A, T) = 1$ otherwise, i.e. if $I(A, T) \neq 1$.

Truth and validity may be defined as before. Then, as shown in Slog, A is a theorem of S iff A is valid under this three-valued significance interpretation. Again the logic is hardly satisfactory as a significance logic (as Slog explains), since there is but little scope to express the nonsignificance of non-initial wff, especially negated wff, as the logic so interpreted contains no classical negation.

The issues of nonsignificance are not so closely bound up with the main issues of nonism, non-existence and intensionality, that we cannot get away, for the most part and at least early on, with one or other of the strategies outlined for disposing of significance problems and keeping the sentential calculus classical in form. (Alternatively, we can simply follow the procedure of Slog, 5.3, and restrict the initial wff to significant values.)

The issue of incompleteness is not so quite readily escaped since incompleteness is tied up with existence (in ways Slog tries, not entirely successfully, to make explicit): yet we want, at least in initial logical investigations, to avoid the complexities an explicit treatment of incompleteness can generate. Again there are several options open, irrespective, by and large, of which assertions get counted as incomplete. Firstly, as with nonsignificance, we can simply exclude incomplete sentences as initial wff; for the compounding principles, with & and ~, never appear to lead from completeness to incompleteness. Secondly, we can adopt a falsidal approach and map all elementary incomplete assertions to falsehood: but that this sort of approach, on its own, leaves much to be desired is evident from such incomplete assertions as the Truth-teller statement, namely "This very statement is true", which we seem to have no reason (outside a questionable doubling back to the Liar statement) to count as false rather than true. There remain other more formally interesting approaches, not available in the nonsignificance case, which rely on important differences between the logics of nonsignificance and that of incompleteness. When p_0 is nonsignificant, so, under classical construal of connectives, is $p_0 \vee \sim p_0$. But even when p_1 is incomplete such assertions as 'if p_1 then p_1' and $p_1 \vee \sim p_1$ are not, it seems, incomplete. This observation offers the way in particular to two further approaches to incompleteness, the supervaluational method and the procedure of treating incompleteness as a cross-classification on truth-valued assertions.

1.15 THE SUPERVALUATION METHOD ILLUSTRATED

The supervaluation method is a two stage affair: firstly (admissible) valuations are characterised, and then supervaluations are defined over these (i.e. in terms of admissible valuations). The initial objective[1] of the method was to obtain a (semantical) way of allowing for violations of bivalence, for assertions which are neither true nor false, and also perhaps for assertions which are both true and false, without upsetting the formalism of classical logical theory, or one of its central semantical notions, that of validity. Where incompleteness occurs, though some assertions will be assigned value true and some value false, some - incomplete assertions - will be assigned neither of these values (but no value, or some other value).[2] The basic idea is that an admissible valuation arbitrarily assigns these incomplete assertions one or other of the values true or false, and that all such admissible valuations are taken - so that any incomplete assertion is assigned true on some valuations and false on other valuations, with the net effect expressed in the superimposed valuation, the supervaluation or resultant, of cancelling the specific arbitrary assignments.

To reproduce classical logic in terms of the supervaluation method, the admissible valuations are classical, i.e. two-valued valuations which assign each wff exactly one of the values 1 and 0, and which conform to the classical rules for &, v, ~. To illustrate the procedure let q_1 represent some true assertion (e.g. 'Pegasus is a horse') - and q_2 some incomplete assertion (e.g. 'Pegasus is 14 hands high', 'Kingfrance is bald' or, to take a different sort of case, '"Homological" is homological'). In the two assertion situation $\{q_1, q_2\}$ there are just two classical valuations I_1 and I_2: the way they assign values and how a supervaluation is determined in terms of these the following table shows (cf. van Fraassen 66, p.487):

Assertion	valuation I_1	valuation I_2	van Fraassen supervaluation	Routley overriding valuation
q_1	1	1	1	1
q_2	1	0	-	i
$\sim q_1$	0	0	0	0
$\sim q_2$	0	1	-	i
$q_2 \vee \sim q_2$	1	1	1	1

Key: Dashes indicate truth-value gaps; i indicates incompleteness construed as an overriding value. Supervaluations, or overriding valuations, are determined from valuations in the way indicated.

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[1] It soon turned out that there was much else such methods were good for, including replacing classical logical theory.

[2] Similarly where overcompleteness occurs, some assertions will be assigned both values.

The example illustrates the method. Now to be precise, and more general:- With respect to a given logic or language L and a given class of admissible valuations for L (i.e. functions from sentences into truth or holding values 1 and 0) a valuation s is a supervaluation iff for every wff A of L,

$$s(A) = 1 \text{ iff } I(A) = 1 \quad \text{for every admissible valuation } I, \quad \text{and}$$
$$s(A) = 0 \text{ iff } I(A) = 0 \quad \text{for every admissible valuation } I.$$

On van Fraassen's account (71, p.95) s(A) is not defined otherwise; on my account s(A) = i otherwise.[1] But for validity these differences make no difference. Validity for L is defined in terms of supervaluations in the expected way, namely A is supervalid (with respect to L) iff s(A) = 1 for every supervaluation s (with respect to L).

Where the admissible valuations are classical, a wff A is a theorem of S iff A is supervalid. That is, the supervaluation method, though it allows for incompleteness, leaves the class of theorems of S unchanged. The argument (which extends to the much more powerful logics subsequently introduced) is straightforward. Suppose A is ordinarily valid, i.e. I(A) = 1 for every classical valuation. Then s(A) = 1 for every supervaluation; so A is supervalid. Suppose conversely A is supervalid, i.e. s(A) = 1 always. Then I(A) = 1 for every classical valuation, so A is valid. (The table given reveals that supervaluations are but a way of reorganising data about validity.)

The supervaluational method of van Fraassen 66 supposed, what the theory of objects rejects, that most ordinary properties cannot be assigned truly or falsely to items that do not exist; that is, van Fraassen took for granted, what is unacceptable, a weak version of the Ontological Assumption. That presupposition is in no way, however, an essential feature of use of supervaluations. What is essential to the method is that falsity of assignment excludes incompleteness: but does it? Look at a - it does not matter whether it exists - ask whether it has f? If it does, af is true. If, for any of a variety of reasons - including incompleteness - it does not, af is false. Incompleteness emerges in other ways (e.g. in a~f also being false). This suggests that incompleteness is a cross-classification, not something like a further truth-value as it is on the supervaluation picture. For example, that the king of France is bald is both false and incomplete: but there is no gap. To pursue such an approach is to reject the supervaluation method.

The supervaluational method, although it has the substantial advantage of leaving the logic S intact (it does interfere with such semantical notions as logical consequence), has other serious drawbacks. A first is a very serious restriction on what can be said: in particular, one cannot state in the logic that a statement is truthvalueless, or reason therein about its truth-valuelessness,[2] yet often it is important to be able to do just that.

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[1] The method is usually attributed to van Fraassen 66 who applied it to deal with truth value gaps. The method was however found independently by the author (in fact in 1964) and used to deal with truth-value gaps and statement-incapability generated by paradoxes: see especially NE, pp.297-98. The apposite supervaluational terminology is of course van Fraassen's: use is made of his much more elegant presentation.

[2] This was the reason given in NE, p.299, for not persisting with the method, i.e. with Interpretation 1.

For example, we shall want to consider the systemic thesis: if an object is incomplete in some respect then it does not exist; and we should want to be able to investigate within the logic what the truth-valuelessness of the Liar statement would entail. Secondly, many of the complex problems in admitting truth-value gaps reappear with the supervaluational method (see the discussion of thesis (II), p.14 ff.).

A supervaluational approach is not, then, the way we want to take; for the approach sometimes gives the wrong results, prevents what needs to be said from being said directly, and unduly complicates the logic of intensionality and inexistence. This is not to say that supervaluational methods are not formally viable, or valuable for various purposes. They are. The same applies also to other members of the larger class of valuational methods to which supervaluations (or two level valuations) belong, the class of hierarchial valuational methods, where higher valuations are defined through valuations further down the pyramidal hierarchy.[1]

The cross-classification treatment of incompleteness has already been seen at work. It can occur, for instance, in an attenuated way with Russell's theory of descriptions where the falsity of both 'The present king of France is bald' and 'The present king of France is not bald' reveals the incompleteness of the present king of France as regards baldness. The king is not similarly incomplete as regards existence. Some false statements are, then, on the cross-classification view, incomplete. Such incompleteness could, and perhaps should, be represented in the logic by an incompleteness connective I read 'It is incomplete that'. Connective I is intensional; for the statements 'The present king of France is bald' and 'The present king of France exists' are truth-functionally equivalent, since both false, but one statement is incomplete or indicates incompleteness, and the other does not. Thus, as only extensional connectives can be defined in S, I cannot be defined in S. To treat incompleteness sententially, whether as a primitive or as a defined notion, S will have to be enlarged. And really an enlargement of S which takes account of subject-predicate structure is required. For what one wants to say (what we started by saying) is not so much that p is incomplete but that, where p is of the form af, a is incomplete in respect of feature f. It is objects, in the first place, that are incomplete with respect to certain features, though this may be reflected back into incompleteness of statements. Also the notions in terms of which incompleteness (of the requisite sort, namely indeterminacy) may be introduced, e.g. predicate negation, are rather more naturally considered (in the first place at least) when further syntactical analysis is made which exposes predicates.[2]

In any case, a logic for a theory of objects depends upon an analysis of sentences into syntactical parts (in terms of which indeterminacy can then be introduced); otherwise there is no way of representing talk about objects in the logic. In a zero-order logic sentential components are analysed into subject-predicate forms, with multiple subject forms expressing relations. To enlarge S to a zero-order logic SQ the vocabulary of S first requires expansion, for instance thus:-

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[1] For example, the semi-valuational methods used very successfully by Latin American logicians belong to this class. Semantics for intensional logics such as P and S4 which use valuations defined in terms of semi-valuations, fall within a general characterisation of supervaluational methods - if admissible both valuations and supervaluations are allowed to be partial functions (as supervaluations are on van Fraassen's account) - upon identifying semi-valuations with admissible valuations and valuations with supervaluations. For a fuller discussion of these important methods, and how they can displace world semantics, see Routley and Loparić 78 and references cited therein.

[2] (Footnote on next page).

initial terms, or subjects	subject variables:	$x, y, z, x', \ldots$
	subject constants:	$a, b, c, a', \ldots$ $x_0, y_0, z_0, x_1, \ldots$
initial predicates	predicate parameters of n place (with n a positive integer):	$f^n, g^n, h^n, f^{n'}, g^{n'}, \ldots$
	predicate constants of n places:	$f_0{}^n, g_0{}^n, h_0{}^n, f_1{}^n, \ldots$

The additional formation rule, that goes along with the expanded vocabulary for composing terms and predicates into wff or sentences is as follows:

> Where $x_1,\ldots,x_n$ are n subjects or terms and f^n is an n-place predicate, then $(x_1,\ldots,x_n)f^n$ is a (elementary) wff.

Where convenient the vector $(x_1,\ldots,x_n)$ will be written in vector notation as $\underset{\sim}{x}$; thus $(x_1,\ldots,x_n)f^n$ abbreviates to $\underset{\sim}{x}f$ (the conventions are as in Slog, chapters 3 and 7).

The postulates of SQ are exactly those of S, but formulated in the expanded vocabulary. The semantics for SQ also can be treated as a trivial variation of those given for S. In a truth-valued semantics, the interpretation I simply assigns each elementary wff $\underset{\sim}{x}f$ one of the holding values 1 or 0 at T (i.e. $\underset{\sim}{x}f$ is treated like p, its syntactical analysis ignored). Then soundness and completeness arguments proceed as for S, with the result that a wff A is a theorem of SQ iff A is SQ-valid under the truth-valued semantics. But it is much more instructive to give an objectual semantics for SQ, not just to prepare the way for quantificational logic, but to separate important

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(footnote from previous page)

[2] But once the analysis is made and indeterminacy characterised, the notion can be extended and reflected back into statemental logic, and the logic of I examined at that level. The extension is from the equation, $Ixf = \sim xf \mathbin{\&} \sim x{\sim}f$, to the sentential form, $IA = \sim A \mathbin{\&} \sim\bar{A}$, where predicate negation is widened to a kind of sentential negation. It is to be expected that the sentential logic of I, like that of contingency, ∇, which it resembles, will be somewhat messy (except perhaps in stronger systems, where the logic of ∇, for example, becomes very elegant). The comparison of indeterminacy with contingency may be brought out by connecting external (sentence) and internal (predicate) negations in terms of a single negation - and a scoping predicate T. Then $\sim A = -TA$ and $\bar{A} = T{-}A$; so $IA = -TA \mathbin{\&} -T{-}A$, paralleling the equation $\nabla A = \sim\Box A \mathbin{\&} \sim\Box{\sim}A$. But it is only a parallel, and the logic of contingency does not furnish a logic of indeterminacy, since, e.g., $\Box$ differs logically from T. In particular, $IA \rightarrow \sim A$ is true but $\nabla A \rightarrow \sim A$ is false.

philosophical issues. The main logical problem with any theory of objects has very commonly been taken as essentially linked with the use of quantifiers; but in fact the key issues separating referential and nonreferential positions arise at the zero-order stage where no quantifiers occur, though domains or sets of objects do.

An objectual model $\underset{\sim}{M}$ for SQ is a relational structure $\underset{\sim}{M} = <T, D, I>$ where T is as before, D is a (nonnull) domain of objects, and I is an interpretational function which, in addition to assigning holding values, as before at T to initial wff, assigns to each subject an element of D and to each initial n-place predicate at T an n-place relation on D^n (i.e. the n-place Cartesian product DXDX...XD of D), for each n. The new, and critical, interpretation clause is that for elementary wff:

> $I((x_1,\ldots,x_n)f,T) = 1$ iff $<I(x_1),\ldots,I(x_n)> \iota\, I(f^n, T)$, i.e. $(x_1,\ldots,x_n)f$ holds at T iff the ordered n-tuple of objects $I(x_1),\ldots,I(x_n)$ instantiates the relation of objects $I(f^n, T)$.

For example, let domain D contain, or consist of, Newton da Costa and Sherlock Holmes, and take f as 'admires' and consider 'da Costa admires Holmes', symbolised say, (a, b)f, with f interpreted as the relation of admiration on D^2. Then that da Costa admires Holmes is true in the model, i.e. I((a, b)f, T) = 1, iff what a is about (i.e. I(a)), namely da Costa, and what b is about, namely Holmes, together instantiate the relation of admiration of T, i.e. da Costa and Holmes stand in the relation of the first admiring the second. Otherwise, apart from the critical clause, truth and validity are defined as for S. Proof of the adequacy of the objectual semantics for SQ can, with only a little terminological adjustment, follow well-trodden routes.

There is nothing technically problematic about the objectual semantics at all. True, it involves objects and domains of these, and only some of the objects and none of the domains exist on the intended understanding of the semantics, but that has little bearing on the clarity of the semantics, which involve naught but clear and distinct notions, domain, object, holding, etc. A domain of objects is simply a set of objects (in the sense of abstract set subsequently articulated, and axiomatised by relevant naive set theory), and objects are, as before, the most general items of signification. 'Object' is used in essentially its ordinary general sense (that given e.g. by the OED) to mean 'item possibly thought of, reflected upon, conceived, apprehended, presented to some sense, ...', or, what is intended to be equivalent, 'item of which something is true'. One half of the equivalence follows from the fact that each element of the listing (provided the '...', allowing for further disjuncts, is correctly interpreted) ascribes a feature; the other half from the fact that anything true of an item, if not already implied (as it would be, since anything can be thought of), could be added to the list. Important contrasts are with the much more restricted terms 'entity' and 'being', both of which mean 'thing (object) that exists' (cf. again OED). Thus, for example, such notions as "impossible entity" and "merely possible being" involve contradictions, but "impossible object" and "merely possible item" do not. Everything is an object, not everything a being; for example (so it will be argued) numbers are objects, not beings, and the same holds for all purely abstract objects. Similarly fictional objects, dream objects and most mental objects, are not beings. Just as objects are not confined to beings or possible beings, so they are not constrained by experience or possible experience (in the main sense of the ambiguous phrase 'possible experience'); it is not required of an object that it conform to Kant's restrictive 'universal conditions of possible empirical knowledge'. (For more on objects, see chapter 4, §1.)

1.15 HOW THE ZERO-ORDER LOGIC PROVIDES A VERY MINIMAL OBJECT THEORY

The semantics is quite undemanding as to what objects are: it is enough that objects can have properties stand in relations, and this (by the Independence Principle) nonentities can do. The example of admiration already reveals as much, and that is only one example from that vast storehouse of such examples, recorded natural discourse. The semantics thus helps confirm theses already advanced, that logic need impose no requirements on its objects as to existence, consistency, completeness, determinacy, exactness, sharp-identity-criteria, enumerability, or the like. Despite assertions to the contrary of the great and powerful, none of these requirements are necessary. Logically, as conceptually, objects can be anything, any object of thought or discourse, just as thesis (M1) has it.

Several of the distinctive features of the logic of items can already be included in SQ, without introducing quantifiers. For example, the versions of the theory of predicate negation and indeterminacy (explained below) can be added directly to SQ. Likewise an existence predicate 'E' can be included in SQ, and the Ontological Assumption simply countermodelled. For consider the factual model with domain $D = \{\text{Holmes, da Costa}\}$, where the factual model is one in which I assigns in accordance with the factual data. Then $I(aE, T) = 1 \neq I(bE, T)$. Let g be the one-place predicate $(a, \;)f$ (in effect '... is admired by da Costa). Then $I(bg, T) = 1$ but $I(bE, T) \neq 1$. In short, a basic natural logic, in which some particular and some general assertions about existence can be made, may be elaborated in advance of any use of quantifiers. Quantifiers are not of the essence when it comes to determining existential claims or commitment.[1]

Zero-order logic SQ - which is classical in form but subject to several interpretational qualifications - provides then a minimal logic of objects. But it is a rather thin and threadbare system: it contains no descriptors or quantifiers, and so it fails to separate free from neutral logics; it contains no (satisfactory) implication or conditional; it includes no modalities; and it allows only some of the important theses concerning objects to be satisfactorily stated. It will have to be enlarged upon. The first enlargement can again take what is syntactically a classical direction, the addition of quantifiers, and the move to a first-order language.

Beyond the zero-order there are the first-order quantificational logics, and, as far as ascending the familiar order hierarchy is concerned, that is all. Here at least there is (superficial) agreement with Quine. Objectually, higher orders make at best dubious sense, and are unnecessary; for, to begin to diverge from Quine, what they try to say, and more, can be expressed much more satisfactorily in alternative ways. But first first-order logics.

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[1] This refutes the following thesis, to which, according to Hintikka, Quine's thesis, that to exist is to be the value of a bound variable, reduces, namely

> OT. The only way of committing oneself ontologically is to use existential generalisation,

a thesis Hintikka advances (59, p.135) but leaves undecided (p.136). For a creature that did not speak quantificationally could still commit itself ontologically, e.g. in an SQ-ish language. Quine's thesis, which is incompatible with the theory of objects, is critically examined in chapter 3.

§16. *Neutral quantification logic.* Reasons for introducing quantifiers and proceeding beyond statemental logic to first-order logic are presented in almost every logic textbook: what is not so often stated is that there are similar grounds for proceeding far past where most logic textbooks stop, first-order theories. The main reasons are of course that much philosophically important discourse and many arguments cannot be adequated formulated or assessed without exposing more logico-syntactical structure than zero-order forms permit. For example, without quantificational analysis there is no way of revealing as valid such sound arguments as syllogistic forms - e.g.

Every dragon is a monster;
Some dragons breathe fire;

Therefore,

Some monsters breathe fire -

or particularisation, e.g.

Socrates no longer exists;

Therefore,

Some thing no longer exists.

Exposing the quantifier terms 'every' (represented, approximately, U) and 'some' (P) is only one part of the orthodox story as to how validity of quantificational arguments is to be explained. Converting the given statements to a uniform underlying subject matter of things or objects (a conversion indicated, e.g., by the conclusion of the second argument), is the important second part of the story, and is a basic strategy in the reduction of apparently special syllogistic arguments to statemental arguments. The conversion uses the appealing strong identities, every ξ = every object which is an ξ, and some ξ = some object which is an ξ (even such equations have their replacement limitations however: e.g. one side is apparently about ξs, the other about every thing; one side concerns a collective, the other side distributes onto elements of the collective). Thus the first premiss of the first argument becomes: Every object which is a dragon is a monster, or, at one remove: for every object such that it is a dragon it is a monster. The introduction of (bound) object variables, in place of pronouns such as 'it', 'the first', etc., is the next part of the story, a part that becomes especially important in representing multiply quantified relational statements (e.g. 'A sailor has a girl in every port', and the $\epsilon\delta$ statements of analysis defining convergence and uniform convergence). Using variables the sample statement becomes: For every x, such that x is a dragon, x is a monster. The final, and most questionable, part of the orthodox story is the elimination of 'such that' or 'which' clauses using extensional connectives of S. An initial ground for concern is that universal and particular assertions get different renditions, the universal sample becoming: For every x, if x is a dragon, then (materially) x is a monster, i.e. using obvious symbolisation $(Ux)(xd \supset xm)$, while the particular: For some x, such that x is a dragon, x breaths fire, becomes: For some x, x is a dragon and x breathes fire, i.e. in assumption-making symbols $(Px)(xd \& xf)$. But the results of the orthodox story are most impressive - at least in the examples chosen and a great many others. The syllogistic artument, for instance, becomes

$(Ux)(xd \supset xm)$, $(Px)(xd \& xf)$; therefore $(Px)(xm \& xf)$, which now *follows* by elementary quantificational steps (primarily quantifier distribution) from the sentential principle of factorisation: $A \supset B \supset. A \& C \supset B \& C$. Note that the assessment of the argument has *nothing to do with existence*: dragons do not exist, nor do living fire-breathing monsters, but that makes no difference to the determination of validity.

The glamour of the quantification analysis of syllogistic reasoning palls somewhat when it is seen that the (rightly) celebrated method renders logically invalid such seemingly correct arguments as:

Every man is mortal ;

Therefore,

Some man is mortal .

The trouble is not that *every* does not imply *some*, that (every $x \ni xm_1$) $x\ m_2$ does not imply (some $x \ni xm_1$) $x\ m_2$, but that $xm_1 \supset xm_2$ does not imply $xm_1 \& xm_2$. The trouble, that is, lies with the usual extensional theory of restricted variables associated with classical logic. The fault is not then a fault of quantificational logic as such, but of an auxiliary theory designed to extend its scope so that it can, among other things, formalise syllogistic reasoning and subsume traditional logic. What is required - an exercise that can be conveniently postponed since the viability of quantificational logic is not affected by the matter - is an improved theory of restricted variables.[1]

In summary, the steps in transforming English syllogistic components to quantificational logical form are, in the universal case, these:

Quantifier exposure	Uniformization	Connective exposure	Variabilization	Extensionalization
(Every ξ)f	(Every object which is an ξ)f	Of every object, which is an ξ, it f, *or* For every object such that it h, it f, where 'h' abbreviates 'is an ξ'.	For every x, such that xh, xf	$(Ux)(xh \supset xf)$

The steps in the particular case are analogous. One major feature to which direct attention has not so far been drawn is the assumption that class-term quantifiers, such as 'every' coupled with class-term ξ, can be reduced to an operation on the elements of the class (and other objects); that is, that there are no collective quantifiers which depend on the structure of the class. Without doubt natural languages include collective quantifiers which do not reduce in such a straightforward way - or even at all - to distributive quantifiers, which do distribute onto elements (cf. Vendler 62). Though a place is made for collective quantifiers in the general logical theory subsequently developed, the prime concern in what follows is with distributive quantifiers; for the main quantificational issues confronting theories of objects all involve distributive quantifiers.

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[1] The criticism of relevant logical theory that it has so far no satisfactory theory of restricted variables - which is true - can hardly be made from a classical standpoint as if it were a point against relevant logics: if it should be, the reply is simply *tu quoque*.

The distributive (unary) quantifiers that can be grafted easily onto zero-order logics are the sentence forming operators U (read now, exactly, 'for every')[1] and P ('for some') which, concatenated with single variables, take wff into wff, typically binding variables in the course of the operation. The formation rules of neutral quantification logic make this precise:

1. Every wff of zero-order logic SQ is a wff of Q, i.e. the formation rules of S together with the additional subject-predicate rule of SQ are also formation rules of Q.

2. Where A is a wff of Q and x is subject variable, (Ux)A is a wff of Q.

Often U is elided, i.e. $(x)A =_{Df} (Ux)A$. The particular quantifier P is defined: $(Px)A =_{Df} {\sim}(Ux){\sim}A$. Quantifier P is read 'for some', never 'there exist'. P is not an existential quantifier. Because locutions of the form 'for some x A(x)' are sometimes clumsy in English (Px)A(x) will also be read, occasionally, 'There is an x such that A(x)' or 'There are As'. In this work, unless existential loading is explicitly indicated, 'There are As' never means more than 'Some object is an A', i.e. (Px)A(x): it does not imply As are or As have being or As exist. "R believes there are winged horses" says no more than "R believes some items are winged horses", which derives from, e.g., "R believes Pegasus is a winged horse": it does not say "R believes winged horses exist", or "R believes in winged horses" where this entails "R believes there exist winged horses". It is true of course that in everyday nontechnical discourse 'There are [is]' commonly, though by no means invariably, carries existential loading, and so amounts, in context, to 'There exist[s]'. For this reason use of 'There are [is]' as a technical term not implying existence of any sort involves a calculated risk, the risk of being misconstrued (whether deliberately or otherwise). But it has the advantage which introduction of new phrase or cooption of a lesser or differently used expression, would not give, that of being able to take over almost the whole of classical mathematics as already existence-free in its formulation. In respect of ways of clearly particularising without attributing existence, English appears to be at a slight disadvantage compared to some other languages, e.g. Later Latin and German, where Descartes' 'datur' and Meinong's 'es gibt' can be used without contextually implying existence (but it may well be claimed that these philosophical uses are already semi-technical). English does however contain verbs which it may be worth coopting to substitute for 'is' in the existentially-loaded sense, e.g. 'particularize' (but 'There particularize nonexistent objects' is going to be difficult to get used to). But even if such terminology were accepted, its advantages would be limited while the copola 'is' remains unchanged; the transitive verb 'is' cannot easily be given away without also sacrificing straightforward and natural ways of stating noneist claims, such as 'Pegasus is a horse' and 'Meinong rightly believed the round square is round'. There is however no need to abandon the transitive 'is' (the intransitive 'is' can be separated: see chapter 3). For the Ontological Assumption is not incorporated in English - only in many speakers', especially philosophers', use of it.

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[1] Alternatively U may be read 'every' and the 'for' read into the bracketing. However, bracket-free notation brings out the unsatisfactoriness of doing things this way.

Although the reverse notation is adopted in formulation of the language in the extrasystemic vocabulary, where A, B, C, etc., express wff, such notation as A(x), B(x,y), etc., will be used to exhibit wff which contain the displayed variables free. Free and bound variables are defined in a standard way; substitution notation and abbreviations are also standard (see, e.g. Slog): in particular, A(t/x) is A unless x is free for t in A and then is the result of substituting t for free occurrences of x in A.

The class of terms is also expanded, in a way that could have been adopted in SQ. To the primitive symbols function parameters and constants are added:-

n place function parameters: d^n, e^n, $d^{n'}$, ...

Constants result by subscripting. The formation rules for wft terms or subjects are as follows:

1. Initial terms, i.e. subject variables or constants, are terms;
2. Where $t_1, \ldots, t_n$ are terms and d is an n-place function parameter, $(t_1, \ldots, t_n)d$ is a term.

The quantificational axiom schemes of Q look like a rewrite of standard axioms (e.g. those given in Church 56); syntactically they are a rewrite, but they mean something very different, i.e., the main differences from pure (i.e. unapplied) classical logic are semantical. To the schemes of SQ the following schemes are added:

Q1. $(Ux)A \supset A(t/x)$ (Instantiation).

The standard notation A(t/x) requires that for nonvacuous instantiation x is free for term t in A.

Q2. $(Ux)(A \supset B) \supset. A \supset (Ux)B$, provided x is not free in A. (U-Distribution).

RQ. $A \rightarrow (Ux)A$ (Generalisation).

Subject to interpretational restrictions enlarging upon those already imposed on the interpretation and application of classical sentential logic, there is nothing amiss with pure classical quantification logic - apart, as we have seen, from the standard interpretations of the quantifiers. The new interpretational trouble is - to go quickly back over ground already covered - especially evident with the existential quantifier, $\exists$ - too commonly conflated with the particular quantifier, P - which is supposed to satisfy the principle of existential generalisation,

EG. $A(t/x) \supset (\exists x)A$.

But let f be the predicate 'is round and square' and t be the term 'Meinong's round square'. Then on Meinong's assignments, already defended, $tf \supset (\exists x)xf$ is false; for tf is true, but $(\exists x)xf$ is false, since there exists nothing round and square. EG in fact fails on quite ordinary assignments: for let a name something that does not exist (e.g. a is Pegasus), and consider the antecedent $a\bar{E}$, i.e. a does not exist. The statement is true; but what EG claims follows from it, $(\exists x)x\bar{E}$, that there exists an x which does not exist, is inconsistent.[1]

Furthermore, through EG, classical quantification theory commits us to, as allegedly logical truths, what are but contingent existential claims, e.g. $(\exists x)(A \vee {\sim}A)$. For that anything exists at all is a contingent matter, not a logical truth. On a proper modalisation of classical quantification logic, which separated the contingent from the necessary truths of the theory, it would be a contingent thesis that $(\exists x)(A \vee {\sim}A)$, i.e. in symbols $\nabla T(\exists x)(A \vee {\sim}A)$, not as readily follows on usual modalisations, $\Box(\exists x)(A \vee {\sim}A)$.[2]

The fault with EG, as free logics have helped bring out, is that a needed antecedent, tE, stating that t exists, has been omitted. With the corrected EG principle

CEG. $A(t/x)\ \&\ tE \supset (\exists x)A$,

the counterexamples and other difficulties adduced disappear. However, as shown, the free logic move does not go nearly deep enough. Quantification over possible objects is also required, and then, for essentially the same reasons, quantification over impossible objects. So results neutral quantification logic, the intended domain of which includes all objects.

An objectual model $\underset{\sim}{M}$ for Q is a structure $\underset{\sim}{M} = \langle T, D, I\rangle$ defined as before for SQ, except that, to cater for functional terms, I assigns to each n-place function at T an n-place operation on D^n. I is extended to all wft and wff by the interpretation rules already given together with these rules:

Where d is an n-place function term and $t_1,\ldots,t_n$ are n terms, $I((t_1,\ldots,t_n)d) = (I(t_1),\ldots,I(t_n))I(d,T)$; $I((Ux)A,T) = 1$ iff $I'(A,T) = 1$ for every x variant I' of I,

where I and I' are x-variants if they agree on all variables and parameters except perhaps at x. Holding, truth and validity are defined as for S. Then, again by familiar arguments, a wff A is a theorem of Q iff A is Q-valid. The arguments are almost exactly the familiar ones, because it is only in the choice of domain D and the surrounding interpretational hedgings that neutral logic Q differs from classical logic. But of course it is changing the role of D that makes all the difference; logical differences reflecting the change appear in the larger picture. Pure quantificational logic itself, despite the attention devoted to it, is really only a small part of the logical scene. What is important at this stage is that there are no interpretational restrictions on Q to objects that exist or that are suitably transparent; D may include incomplete as well as inconsistent objects. Nor does quantification logic require such restrictions; nor are they inevitable unless the semantical rules are construed in a way not intended, referentially. To put it differently, the neutral logic formulated has been formulated, extrasystematically, in neutral terms; e.g. 'every' in the semantical rules does not mean 'every existing' or 'every entity which is such that'; the operations and relations spoken of in English phraseology are not taken to exist; and so on. To put the point in phraseology of the opposition, the metalanguage used and presupposed is Meinongian. That does not imply that the usual classical quantifiers cannot be expressed. They can of course in terms of usual restricted variables, e.g. $(\exists x)A \equiv (Px)(xE \& A)$. Much else too can be expressed by small additions to the logico-semantical theory. For example, by a modest enlargement of either the syntax or, better, the semantics, context can be taken into account (as Slog explains; see especially 7.2), and much of what is normally included in pragmatics thereby expressed in the theory.

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[1] This is one of the bad arguments for existence not being predicate inverted so that a good argument results.

[2] $\Box(\exists x)(A \vee {\sim}A)$ is not valid according to free quantified modal logic, (or its neutral counterpart), but that is not a modalisation of classical quantification logic.

Many of the more old-fashioned logical theories and axiomatisations of parts of mathematics and fragments of science can be reexpressed as first-order theories (of Mendelson 64, p.56). A neutral first-order theory is an axiomatic formal system enlarging Q by (proper) axioms or axiom schemes formulated in the notation of Q, which is closed under the rules of Q (i.e. Material Detachment and Generalisation apply not just to theorems of Q but to theorems of the theory). Since (almost) every classical first-order theory can be restated neutrally, (almost) everything that can be expressed in a classical first-order theory can be neutrally stated, e.g. substantial fragments of classical mathematics can be neutrally expressed. The restatement is an important part of the neutral [re]statement of mathematics.

There is however one outstanding problem with the neutral reformulation of first-order theories that becomes serious once - what are hard to avoid - inconsistent theories, and objects, are encompassed; namely the matter of the limitations on rule γ of Material Detachment. For the rule is inadmissible in inconsistent cases (see, e.g., RLR). The limitations also suggest an appropriate restriction on the rule:

> Provided T is consistent, from $\vdash_T A$ and $\vdash_T {\sim}A \vee B$ (one is entitled to) infer $\vdash_T B$,

where $\vdash_T C$ says that C is (provable) in or holds in T.[1] Most of the logical theories customarily examined in logic texts, with the exception of set and number theories, are certainly consistent, so the proviso can be detached, and the usual unqualified inference rule recovered. Where consistency is not certain, the classical formulations of theories can be said to proceed under the provisional assumption of consistency. If inconsistency is found, the assumption is contradicted, and the provision should be withdrawn, whereupon many inferential operations would stop. This gets at what seems right about Wittgenstein's (super-[2]) rule:

> If a contradiction is encountered, Stop!

a rule which would indeed put an end to the insidious spread of contradictions given the classical scheme of things. But much is wrong with Wittgenstein's rule. Firstly, many of us, whether classically or paraconsistently inclined, or logically uncorrupted, do not stop reasoning in the face of contradictions or when a contradiction is encountered. Nor should we stop; for inconsistent situations are not alogical (see UL). Secondly, the rule is not appropriately effective. It is as if the proviso on γ were to be replaced by the condition: Provided no theses of contradictory form have been proved. The proviso could always be got around by failing to complete any proof that looked as if it were leading to a contradiction. Unscrupulous users, intent on yet more powerful theorems, would deliberately avoid encountering contradictions. Thirdly, then, what a logic contained as theorems would depend on who was using it and in what order they proved theorems. Wittgenstein's rule is thus formally unsatisfactory, in addition to failing as an adequate safety valve for a logic in case it should blow up.

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[1] A rule of this form is defended in Routley 79, and two difficulties dealt with, the sceptical objection that really no theories are known for certain to be consistent, all consistency proofs being relative, and the issue of the justification of the restricted rule.

[2] Unless the rule overrides other rules, proof and inferences may continue by other rules in contravention to the rule. In this respect the rule differs from the standard rules of inference of logistic systems.

A full neutral reformulation of a classical theory involves more then than reexpressing the quantifiers and other operators neutrally (and reshaping, what has not yet been fully considered, identity theory); it also includes exposing the provisional consistency assumption of theories whose consistency is unproven.

§17. *Extensions of first-order theory to cater for the theory of objects: existence, possibility and identity, predicate negation, choice operators, modalisation and worlds semantics.* While existence and identity predicates can be represented in first-order theories, there is much of importance that cannot be so expressed, e.g. intensional connectives, predicate modifiers, collective quantifiers, and many descriptors. A comprehensive logical theory of objects that can get to grips logically with modern (and not merely peripheral) philosophical problems will have to allow for all these parts of discourse. Thus it is essential to proceed beyond the limits of first-order vision.

Even so there is much that can be accomplished, if sometimes superficially, at the first-order stage. An obvious, and important, step is to introduce 'exists' as a constant (logical) predicate. Such a move encounters an immediate obstacle, which acted for many years as a severe road-block to investigation of the logics of existence and nonexistence, namely the dogma of classical logical theory that existence is not a predicate.

Fortunately the dogma is now very much on the decline, and is no longer a serious impediment to logical investigations. Even so criticising the dogma is far from flogging a dead horse. While the dogma will be rejected, a modified thesis will be defended in its stead.

1. (a) Existence is a property: however (b) it is not an ordinary (characterising) property. Since the dogma that existence is not a predicate, or not a property, is often supported by an (illegitimate) appeal to historical authority, it is worth remarking that some of those who are cast as leading defenders of the dogma, in particular Kant to whom the thesis is traditionally attributed,[1] did not assert or defend the dogma at all, but asserted something rather closer to thesis 1.

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[1] (footnote on next page)

1.17 EXISTENCE IS A PROPERTY, AND KANT'S ACCOUNT

Kant's thesis is (a) *'Exists' is a logical predicate but* (b) *it is not a real predicate, i.e. a determining predicate*, where

> a *determining* predicate is a predicate which is added to the concept of the subject and enlarges it. Consequently it must not be already contained in the concept ... [exists[1]] is not a concept of something which could be added to the concept of a thing. It is merely the positing of a thing, or of certain determinations, as existing in themselves, (34, p.282; 29, p.505).

The question: What sort of predicate is 'exists'?, what sort of property existence?, is one that will recur: and then it will emerge that Kant's elaboration of his thesis (b) is seriously mistaken. The fundamental trouble with Kant's account of existence[2] lies in his assumption that what exists does not differ as regards content from what is possible: thus, e.g.,

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[1] (footnote from previous page)

For example Kiteley introduces his paper 64 thus:

> Kant's laconic observation that existence is not a predicate has enjoyed an almost spotless reputation.

Even within the western analytic tradition the dogma has not had quite such a reputation. For example, it was not accepted by Moore, who characteristically said he was 'not at all clear as to the meaning' of the slogan (59, p.115), and who elsewhere both introduced 'exists' as a logical predicate (59, p.87) and explicitly took existence to be a property (53, p.300; but see also p.372). With the advent of the broader free logic tradition (noted at the beginning of §14), the dogma has been regularly questioned and rejected. See also Nakhnikian and Salmon 57.

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[1] The translation 34 has 'being' where I have for uniformity inserted 'exists'; however Kant (appears to have) equated being and existence.

[2] There are other major defects as well, most notably in Kant's unnecessarily restricted notion of *object*. While it is true that existence is never analytically held, that 'the object, as it actually exists, is not analytically contained in any concept, but is added to my concept ... synthetically' (p.282) - which is enough to halt the Ontological Argument - the following elaboration Kant offers is in error:

1. '... through the concept [,] the object is thought only as conforming to the *universal conditions* of possible empirical experience in general, whereas through its existence it is thought as belonging to the content of experience as a whole' (p.283). Both parts are seriously astray. There is no restriction on objects conceived that they be restricted either through possibility *or* through empirical requirements. And it is neither necessary nor sufficient for existence that an object be thought as belonging to the content of experience as a whole.
2. '... in dealing with objects of pure thought, we have no means whatsoever of knowing their existence, since it would have to be known in a completely *a priori* manner' (p.283). Often we can know a priori that they do *not* exist - this blocks the sceptical moves Kant immediately proceeds to (p.284) - and sometimes we can ascertain that something exists without a detour through perception, e.g. in terms of relations of an object to what exists, or through other marks of existence.

A pervasive defect of Kant's account is its subject-relativism, e.g. concepts are a determination of one's state, and underlying this, its human chauvinism.

> the content of both must be one and the same; nothing can have been added to the concept, which expresses merely what is possible, by my thinking its object (through the expression 'it is') as given absolutely. Otherwise stated, the real contains no more than the merely possible (34, p.282);

and

> if we attempt to think of existence through the pure category alone, we cannot specify a single mark distinguishing it from mere possibility (p.283).

As we shall see (especially in chapter 9) there are important differences in content, and there are several marks, readily specified, which serve to distinguish what exists: an object exists only if it has a *right amalgam* of properties and the *right sorts* of properties.

The immediate object is however, to dispose of the unqualified claim that existence is not a property, and the claim that often goes with it (negating Kant's (a)) that existence is not a logical predicate. It will be argued that the Ontological Assumption is assumed in the main argument for the unqualified dogma, and that there is nothing behind the remaining arguments that cannot be better captured by the claim: existence is a property, but a somewhat special property. Furthermore the new claim, despite its lack of specificity, does make a difference: it permits an investigation of the logic of existence, and it removes another of the mechanisms shielding classical logical theory from legitimate criticism as to its limitations.

It might be thought that the dogma is not required by classical logic and that classical logicians have no reason to try and expose it. Superficially this is so: a rather uninteresting existence predicate can be defined in quantificational logic using the connection (a theorem of neutral logic) $xE \equiv (\exists y)(x = y)$, x exists iff there exists something which is (the same as) x. Since $(\forall x)(x = x)$, $(\forall x)(\exists y)(x = y)$, whence $(\forall x)xE$, every thing^E exists. Thus too classically, any logical truth containing just one variable free can be used to define 'E', e.g. $xE \equiv .\ x = x$. And then the property may be defined by abstraction, specifically by λ-conversion: Existence $=_{Df} \lambda x(xE)$ (whence, classically, Existence = Self identity!). The upshot, if this were all that could be said classically about existence, would be severe interpretational inadequacy: classical logic would have nothing to say about, and would be unable to assess arguments concerning, negative existentials, the existence of God, the existence of material objects and matter and space, of theoretical and fictional objects, etc.

The deficiency is avoided by admitting another - compatible but competing - predicate E!, well-defined for descriptions, but inapplicable to fully quantifiable subject terms. It is this predicate E! which is the existence predicate; it is the predicate in terms of which it can be legitimately asserted, God does not exist, i.e. in classical canonicalised notation $\sim E!\,\iota x Godx$. It is this predicate, furthermore, that is not, or does not yield, a property and *cannot* do so. Classical theory need not deny (even if some of its exponents are inclined to deny) the obvious truth that 'E!' or 'exists' is grammatically a predicate.

The slogan "existence is not a predicate" was not intended (as Kneale 36 and many others have pointed out) to deny that 'exists' is a grammatical predicate of English (which it certainly is), but to deny that 'exists' is a logical predicate. A *logical* predicate is, according to OED, 'what is affirmed or denied of the subject': while to predicate is, logically, to 'assert (thing) about subject' (OED again). Given such connections, it is a direct outcome of the Reference Theory that 'exists' is not a logical predicate - or that 'exists' does not signify a property (to put it in terms that not all those happy to talk about logical predicates would be prepared to use, because of the apparent commitment to universals). For suppose 'exists' were a logical predicate: then in such negative existentials as 'Blahblah does not exist' one would deny something (existence) of the subject, Blahblah. But this is impossible; for there is^E no such subject (i.e. object). Put differently, a true statement, a correct denial, would have been made about what does not exist, a property would have been assigned to a nonentity, contradicting the Ontological Assumption. Or, slightly differently again, it would follow (yes, by the OA) that Blahblah exists contradicting its nonexistence. With the proper abandonment of the Ontological Assumption goes the direct, and main, argument for 'exists' not being a predicate.

Or differently again:- If existence were a predicate, then all positive existential statements would be analytic and all negative ones inconsistent. But it is false that all existential statements are either analytic or inconsistent. So it is false that existence is a predicate.[1] The argument for the critical first premiss depends however on the Ontological Assumption: it is that the ascription of a predicate to a thing implies that the thing exists. Thus if ~aE then aE & ~aE; while aE would, it is alleged, already imply aE.[2] Thus, again, the argument fails with the Ontological Assumption.

Some of the other arguments for the thesis are removed in the same sort of way, including a leading argument that logic cannot tolerate an existence property, without inconsistency. For suppose otherwise, the reductio argument begins, that E! were a property. Then

(1) Nonexistence, i.e. in effect ~E!, is a property. For, on standard Russellian assumptions whenever ψ is a property, $\sim\psi$ is also a property, as follows from property abstraction principles.

Now

(2) Nonentities do not exist. Therefore (by conversion)

(3) Nonentities have the property of nonexistence.

But

(4) Whatever has a property exists; $\psi(\iota x)\phi x \supset E!(\iota x)\phi x$, by PM*14.21.

Hence nonentities exist, contradicting (2). The argument, though valid, is not conclusive, because it depends (essentially) on the Ontological Assumption in the shape of premiss (4).

Most other arguments for the thesis are also referentially based -

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[1] Cf. Wisdom 31, pp.62-3; Ayer 46; and Broad 53.

[2] A little more plausibly the ascription of existence is, wherever true, redundant, given OA.

The redundency alleged in statements like 'There are horses which exist' is a contingent redundancy deriving from the fact that in the assumed context of occurrence 'There are' carries existential loading, i.e. amounts to 'There are^E'. In other contexts, there is no redundancy, e.g. prefix the statement by 'In contrast to Pegasus'.

inevitably, and unsurprisingly, since without assumptions of the Reference Theory the thesis is readily avoided. Consider, first, another leading argument designed to show that (classical) logic cannot admit a genuine existence predicate, i.e. one in terms of which one can truly say that ~aE for some term 'a'. The argument is yet another variant of the "problem" of negative existentials. If existence were a genuine predicate, then from truths of the form ~aE it could be inferred, by Existential Generalisation, what is impossible $(\exists x)\sim xE$. So .... The argument would work were EG correct; and its assumed correctness is yet another product of referential assumptions.

Consider, next, the contrastive argument, an argument based on the referential thesis: Everything exists (because quantifiers have to be referentially restricted and a thing just is an object of reference). The further assumption the argument uses, the contrastive assumption, is that every genuine predicate makes a contrast. But to add 'existent' or 'which exists' to a subject a is to add nothing. This argument tends to get itself into trouble, because proponents go on to say that to assert "a exists" is to assert nothing, because 'exists' is redundant; and then find themselves saying that conversely to say that "a does not exist" is contradictory - which is obviously wrong given the previous claim. The usual escape from the latter predicament is well known: firstly, 'a exists' is not redundant in the way a tautology is; and, secondly, 'a exists' is misleading as to logical form and is not really of subject-predicate form, but, if anything (when a is a proper name it is nothing), a disguised quantified statement. The trouble with this escape has already been explained (cf. p.32 ff):- 'Exists' is only redundant where existential loading is presupposed, and then its redundancy is a contingent matter; where loading is not supposed as in 'Pegasus exists' the predicate is not redundant. The logical form of 'a exists' is the subject-predicate form, aE, which is perfectly in order as it is. The other assumptions of the argument fare no better. The contrastive assumption is decidedly dubious, and indeed appears to be refuted by mathematics where theorems often show that (analytic) properties are without contrast. And the first, referential, assumption has already been rejected. Since some things do not exist - nor is this an isolated phenomena, most things do not exist - 'which exist' does make a contrast.

Remaining arguments that existence is not a predicate show at best that existence is not an (entirely) ordinary characteristic. Of this sort is Malcolm's point (60, pp.43-4) that existence would not be in a list of desired qualities to be sought in a chancellor. Nor would a great many other features (e.g. almost all logical and mathematical properties). All the point shows on its own is that existence is not the sort of predicate that would appear on such a list. If an attempt is made to generalise that point to the claim, which might be more telling, that existence is never a feature that we would look for in anything, then the outcome is falsity. 'There are many times where the important thing is to find out, not whether it has a long or short snout, but whether or not it is extinct or extant' (Kiteley 64, p.365). More important, there are certainly logical differences between what exists and what does not, e.g. such matters as indeterminacy, interrelation with entities (e.g. one cannot deposit 100 nonexistent, or imaginary, dollars in Goddard's bank account): that does not show that existence is not a predicate, without a redefinition of 'predicate'. There are significant logical differences between objects on either side in the classes distinguished by such category markers as 'abstract', 'individual', 'physical', 'mental', etc.; but that does not rule out categorical predicates as logical predicates.

Another argument of this sort runs thus:

> if existence is a predicate, then you should be able to affirm it universally and deny it particularly. You can, however, do neither of these. It is equally nonsensical to say either "All tame tigers exist" or "Some tame tigers do not exist". The square of opposition for existence-statements is fearfully truncated, indeed to the point of losing a dimension. Thus, existence cannot be a predicate. (Kiteley 64, p.367).

The argument is adapted from Moore's discussion (in 59); but Moore neither claims that 'All tame tigers exist' and 'Some tame tigers exist' are nonsensical - they are significant sentences - but only that they are 'queer and puzzling expressions', nor jumps to the conclusion therefrom that existence is not a predicate. Moreover Kiteley proceeds to demolish the argument he has reconstructed from Moore's influential, but inconclusive discussion. Some fillings of the frames 'All ... s exist' and 'Some ... s do not exist' give natural enough expressions, e.g. 'All the stamps in this issue exist'. Even 'All tame tigers exist' can be placed in a context that makes it come to life, as Kiteley shows with a nice example (p.368). Such examples

> seem to show that the verb "exists" does have uses, perhaps predicative uses, that go easily and naturally through all the quantifier changes from none to all in the schedule of generality. Moore was not unaware of this. He found a use of "not exists", viz. being imaginary, that went through the schedule (p.368).

In short, the assumption regarding the square of opposition is mistaken. But Kiteley fails to see his demolition job as demolition: Indeed he repeats the extraordinary conclusion that

> If ... one use of "exists" can be found which does make nonsense out of universal affirmative statements in which it appears, then the concept of existence associated with this use of the verb would not be a predicate (p.368).[1]

The same argument, mutatis mutandum, would show, if accepted, that all ordinary concepts are not predicates: consider, e.g. Moores' paradigm frame 'All ... growl' and subsitute 'mental images' or 'rhododendrons'.

An argument similar to that adapted from Moore derives from remarks of Russell (already discussed in §12), namely

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[1] Kiteley claims that there is such a use, what he calls the 'exiguous use'. But he establishes neither that the use 'makes nonsense out of universal affirmatives' nor that this shows that 'exist' (in the relevant sense) is not a predicate. The characterisation of the "exiguous use" depends on the transformation form '... exists' to 'There are^E (exist) ...'; but it is more plausible to say the transformation breaks down in the case of subjects of the form 'all ... s' than that it defines a use. Consider, e.g., what happens to the truth 'All existing tigers exist'; it maps into the doubtfully significant 'There exist all existing tigers'. But a minimum requirement on such a transformation is that it preserves truth. Kiteley has not defined a clear usage.

> If existence is a predicate, then there are certain kinds of inferences that should be valid. For example, the inference from "Donkeys exist and Eeyore is a donkey" to "Eeyore exists" should be valid. It is clearly not valid, so existence cannot be a predicate (Kiteley, p.370).

Russell, recall, contended that the fallaciousness of these arguments with 'exists' parallelled that of such 'pseudo syllogisms' as "Men are numerous; Socrates is a man; therefore Socrates is numerous"; and that the arguments show that 'exists', like 'is numerous' is a predicate not of particular things, but of propositional functions. But (as previously observed) the arguments are not parallel. 'Exists' is distributive, 'is numerous' is not, the conclusion 'Eeyore exists' is significant, while 'Socrates is numerous' is not (parallels would replace 'exists' by class predicates such as 'are a species'). There are several things wrong with the argument Kiteley has constructed which however he does not observe. Firstly, being a (logical) predicate does not require validity of such inferences. Consider e.g. 'is four footed' and replace 'donkeys' by 'foxes'; then the argument fails since 'Foxes are four footed' is not a universal claim, but a normative one (rather 'Foxes are normally four footed'; compare 'Sassafras flowers in August'; etc.) Secondly, if 'Donkeys exist' were construed universally as say 'All donkeys exist' then the argument cited would be valid. But an expected reading of 'Donkeys exist' is 'Some donkeys exist', which leads to no expectation of validity, and does nothing to support the thesis. Nor is the predicate 'exist' particularly unusual in suggesting a particular construal of a class term: Compare 'Horses are black, horses are gray, ...', 'Horses are sometimes seen here', 'Horses get bots', 'Hazels are found in England', 'Pollution is a Japanese problem', etc.

The remarkable success of the arguments for existence not being a property - appallingly bad arguments, unless referential assumptions are taken for granted - encouraged philosophers to claim that a variety of other properties, among them some of the most important and interesting in philosophy, were not predicates, e.g. goodness, beauty, identity, diversity, numerousness, imaginariness. The arguments were however substantially weaker, since many of the arguments that applied in the case of existence, including all the more striking reductio arguments, did not transfer - except in the case of predicates of the same cast as 'exists', such as 'imaginary' and 'fictional'.

Consider - for the illustration is instructive for subsequent investigations (especially chapter 7) - Ryle's case that 'being imaginary is not an attribute' (conclusion (1), Ryle 71, p.81). Ryle's arguments parallel precisely, indeed are modelled upon, the standard arguments that existence is not a property, almost all of which turn on the Ontological Assumption and collapse when that is removed. For example, Ryle supposes that 'an imaginary elephant has none of the attributes of an elephant or of any thing else' (p.65) because what and only what exists has attributes, 'a thing's being red or being an entity or being an object just consists in the fact that it has attributes' (p.64), i.e. because of none but the Ontological Assumption (which gets repeated over and over again on pp.64-5). Ryle's case is however marginally informative, for it helps to confirm the claim that what is correct in the "Not a property" doctrine, i.e. the small part that is not bound up with the Reference Theory, can, without loss, be more satisfactorily captured by saying "Not a property of a certain sort".

In sum, the standard arguments that existence is not a property do not establish the intended conclusion, but reveal rather that existence is not a characteristic, i.e. not a characterising property, and, at the same time, that existence is not an assumptible feature. They also help in showing (what earlier arguments made plain) that subjects do not always carry existential loading, and that existence is never necessarily had.

2. 'Exists' as a logical predicate: first stage. Existence is a non-trivial predicate, which makes a contrast; for something exists, but not everything does. Some things such as Pegasus and square circles, do not exist. These elementary truths cannot be stated in pure quantificational logic, however, whether interpreted classically, or reinterpreted neutrally. If the quantifiers are read, as in classical theory, existentially, then while it can be "said" that some things exist, through such circumlocutions as $(\exists x)(p \vee \sim p)$, it cannot be said that some things do not exist, on pain of contradiction. If however the quantifiers are read nonexistentially, then while it can be consistently admitted that some things do not exist, classical ways of stating that some things exist are lost. An escape from this dilemma is easy however once an existence predicate is introduced, or defined - a procedure to which there is now (in view of the preceding subsection) no bar. At this, first, stage 'exists' is introduced as a further primitive and some of its logical features investigated; subsequently, in later stages, the question of whether it can be defined and, if so, how, is addressed.

The system QE of quantified neutral logic with existence results from Q by the addition of one-place predicate constant E. (Alternatively, one of the constants of Q may be assigned the role of E.) The formation rule for E is just that for such constants, i.e. where t is a subject term tE (read 't exists') is a wff. There are, at least in the base system QE, no special postulates on E. Even so, much can be accomplished in QE, syntactically, proof theoretically, and semantically. Syntactical and also proof-theoretical applications, such as the recovery of free logics and of various other logics without existential presuppositions, are facilitated by defining existentially-loaded quantifiers in terms of E. Appropriate definitions, in the classical restricted variable pattern are these:

$(\exists x)A =_{Df} (Px)(xE \& A)$, i.e. there exists an x for which A iff for some x which exists, A; $(\forall x)A =_{Df} \sim(\exists x)\sim A$. It is readily provable, using quantification logic that

$\vdash (\forall x)B \equiv (x)(xE \supset B)$,

i.e. every existing x is B iff for every x such that (classically) x exists, B. Once the theory is modalised (as in a subsequent subsection), stronger equivalences than material connections may be established; in particular, main equivalences can always be strengthened to strict (i.e. logically necessary material) equivalences, as in $\vdash (\forall x)B \leftrightarrow (x)(xE \supset B)$. The quantifier may commonly be read 'for every existing' or 'for all actual'.

With this little apparatus several sentences usually judged to lie beyond the scope of the formalism of quantification theory can be symbolised; e.g. 'Churchill exists' can be represented cE and 'something exists' (Px)xE. Substitution in the theorem

$yf \supset (Px)yf$ gives $cE \supset (Px)xE$,

i.e. if Churchill exists then something exists. All the usual predicate inferences can be specialized in this way for the predicate 'E'; e.g. from $(x)(xf_0 \supset xh_0)$, (say, all unicorns are one-horned) and $(Px)(xf_0 \& xE)$ (some unicorns exist) follows $(Px)(xh_0 \& xE)$, i.e. $(\exists x)xh_0$ (there exist one-horned things). A generalization of 'Round squares do not exist', radically interpreted, can be symbolized $(x)(xf \& \sim xf \supset. \sim xE)$; and in view of the equivalence: $(x)(xf \mathbin{\&} {\sim}xf \supset. {\sim}xE) \equiv {\sim}(\exists x)(xf \mathbin{\&} {\sim}xf)$, can alternatively be expressed in the regular way as ${\sim}(\exists x)(xf \mathbin{\&} {\sim}xf)$. 'Some things do not exist' is symbolized $(Px){\sim}xE$; its equivalent 'not every item exists' by ${\sim}(x)E(x)$. These sentences do not yield contradictions, a point about which there need be no difficulty so long as it is remembered that 'a does not exist' can be explicated by ''a' is a subject term without a referent'. Thus $(x)E(x)$ is not universally true - unless the class of domains with respect to which interpretations are allowed is severely, and illegitimately, curtailed - and is *not* a theorem, as can be demonstrated using a decision procedure for monadic predicate calculus under which E is treated as an ordinary predicate. But "There are things that don't exist," i.e. $(\exists x){\sim}E(x)$, is impossible since it is equivalent to $(Px)(xE \mathbin{\&} {\sim}xE)$. Thus too

> $\vdash (\forall x)xE$, i.e. everything^E exists, or, more trivially, every thing which exists exists.

This is the $\forall$-interpretation theorem, $\forall$IT. Correspondingly for existential quantifier $\exists$, $\vdash {\sim}(\exists x){\sim}xE$, i.e. it is not the case that there exists a thing that doesn't exist. $\vdash A(t/x) \mathbin{\&} tE \supset (\exists x)A$, existential generalisation, is admissible provided the item guaranteeing generalisation exists. The principle is of course the free logic existential generalisation scheme FEG, already much discussed.

Recovery of free logic is now in sight. For it follows, since the distinctive theses of free logic ($\forall$IT and FEG) have been derived that *free quantification logic is embedded in QE*. But a better result can be obtained, namely

> *QE is a conservative extension of free quantification logic, FQ*;

that is, where A is a wff of FQ, A is a theorem of FQ if and only if A is a theorem of QE (counting in defined quantifiers). One half of the theorem follows from the previous theorem, but the converse half requires much more work (for requisite details of a semantical proof see DS, p.616; for a more complex proof-theoretical argument see SE, p.256, and a correction thereto). Thus QE includes, appropriately, free logic, but rightly proceeds beyond it.

Several other logical systems, aimed at rectifying in varying (usually insufficient) degrees the manifold faults of classical logic, can also be recovered or represented in QE. Examples (some of them considered in detail in SE) include Rescher's two-sorted logic of existence (of 59); Hailperin's theory (in 53), and other theories, of empty domains, i.e. of domains without *existent* elements; the presuppositionless logics of Leblanc and Thomason (in 68); and - when identity is added - Hintikka's systems (of 59) without existential presupposition; the system of Leblanc and Hailperin for singular inference (in 59). Naturally, too, classical quantification logic itself can be represented, under requisite restrictions of free and bound variables; namely, when all variables are existence-restricted, classical quantification logic results. More specifically, if $A(x_1,\ldots,x_n)$ is a wff of classical quantification logic CQ, i.e. contains only truth-functional connectives and existentially-loaded quantifiers, and $x_1,\ldots,x_n$ are all the free (subject) variables in $A(x_1,\ldots,x_n)$, then $\vdash_{CQ} A(x_1,\ldots,x_n)$ iff $\vdash_{QE} x_1E \mathbin{\&}\ldots\mathbin{\&} x_nE \supset A(x_1,\ldots,x_n)$. A corollary is that QE exactly contains the closed theses of CQ, where a wff of CQ is closed when it contains no free variables. That is, where A is a closed wff of CQ, $\vdash_{CQ} A$ iff $\vdash_{QE} A$. But although QE *conservatively* extends closed CQ, it does *extend* it, and this is what really counts.

Such conservative extension results are perhaps most readily proved using semantical analyses, which are of independent interest. Semantics for QE results from that already given for Q by the addition of a domain D_e, interpreted as the domain of entities, which is included in the domain D of objects. That is, a QE model is a structure $<T, D, D_e, I>$ where $<T, D, I>$ is a Q model and D_e is some subset of D. The evaluation rule for constant E is then:

$$I(xE, T) = 1 \text{ iff } I(x) \in D_e.$$

Given that E is a predicate the usual extensional evaluation rule yields the result $I(xE, T) = 1$ iff $I(x) \in I(E, T)$, whence the rules coincide given the expected connection $D_e = I(E, T)$. Using this connection, an adequacy theorem for QE is an almost trivial expansion of the adequacy (i.e. soundness and completeness) theorem already stated for Q.

Since in the factual model, which reflects the way things are, Madras and Marcuse belong to $\underline{\underline{D}}_e$ but Ruritania and Protagoras do not, but belong to $\underline{\underline{D}}$, the semantical rule for E yields the correct result that existence is a property that Madras and Marcuse have but Ruritania and Protagoras do not (see further SE, pp.251-2). [PS. Marcuse no longer belongs to $\underline{\underline{D}}e$; Madras still does.]

It follows using the semantics that the thesis that every thing exists, (x)xE, is not valid, and so not a theorem of QE. A persistent objection from advocates of both classical and free logics is however that "everything exists" must be true, which implies quantifiers are always existential. The theory of QE shows that such a thesis is false; sensible and coherent non-existential interpretations of quantifiers can be given - interpretations which converge with such intuitively valid arguments as those of the form "a (e.g. Pegasus) does not exist; so something does not exist; so not everything exists". When other arguments which can be heaped up against the truth of the "Every thing exists" are added, the cumulative case against the thesis is formidable. Rescher, for example, has adduced the following simple but powerful considerations. The first argument relies on the fact 'that certain things are possible, though not in fact actual or extant [, e.g.] ... while unicorns do not exist, it is perfectly possible that they might' (59, p.161). That is, for some x, $\Diamond xE$ & $\sim xE$.[1] But this implies that, for some x, $\sim xE$, contradicting for every x, x exists. Moreover rejecting the fact leads to the mistaken principle $(x)(\Diamond xE \supset xE)$ and more generally to the 'unsavoury doctrine of *a posse ad esse valet consequentia*'. The second argument turns on the fact that 'there are true but counterfactual existential statements', e.g. "if Superman did exist, several world sporting records would be different". Consider any such statement S, which will have an antecedent of the form aE. Since S is counterfactual, $S \supset \sim aE$ whence contraposing $aE \supset \sim S$. But $(x)xE \supset aE$,[2] whence $(x)xE \supset \sim S$; that is, 'the assertion of (x)xE precludes *ab initio* the truth of any counterfactual existential statement whatsoever' p.162). Finally, even if it were not the case that use of the English 'every' accorded with noneism, a new quantifier which did could readily be introduced, e.g. substitutionally, by way of such truths as that Pegasus does not exist.

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[1] The modal connective $\Diamond$ reads 'It is logically possible that': its logic is examined shortly.

[2] It is this link of the argument, rather than (x)xE, that will be rejected by anyone inclined in the direction of free logic. But the case against free logic has already been argued.

Since "every thing exists" is false, it is true that some things do not exist. Indeed this is necessarily true, since, as we have seen and will see again, many sorts of objects cannot exist, not only inconsistent objects, but also abstractions. By contrast, the statement "some things exist" though true, and ostensively verifiable, is not necessarily true and cannot be rendered a fact of pure logic.

System QE is inadequate to express these matters. For it also follows from the semantics that "Some things exist", i.e. $(Px)xE$, which is equivalent to $(\exists x)E(x)$, is not a theorem and quite properly does not follow from $(\forall x)xE$; and that $(Px){\sim}xE$, like $(Px)xE$, is not a theorem of QE. Whether these statements are valid in a system depends, in fact, on the width of the domain of objects and on the criteria for existence admitted. If properties such as non-existence, for example, are admitted as objects then it is demonstrable in unrestricted predicate logic that something does not exist. Again, if a logic includes appropriate Characterisation Principles, it is demonstrable that various impossible objects do not exist. In the interim, however, before such principles are adduced, QE can be extended by such theses as $(Px)xE$ and $(Px){\sim}xE$ - call the result QSE. A significance analogue of QSE is investigated in some detail in Slog, p.529 ff.

3. The predicate 'is possible', and possibility-restricted quantifiers Π and Σ. What has just been done for existence may be repeated for possibility - and indeed for a variety of other object attributes of an ontic kind (e.g. 'is imaginary', 'is fictional', 'is created'); and then all these things may be done at once. But first to possibility: 'is possible' is a perfectly good predicate, which concatenates significantly with singular subjects signifying bottom order objects. For example, it is true that Pegasus is possible, but "Meinong's round square is possible" is false.

The system $Q\Diamond$ (similarly $QE\Diamond$, etc.) results by the addition of the one-place predicate constant $\Diamond$ to Q, or alternatively by the selection of one of the constants of Q to undertake the role of $\Diamond$. The addition of $\Diamond$ to Q increases the expressive power of the logic in much the way that the addition of E does. Likewise too, possibility-restricted quantifiers can be defined and applied to similar tasks to existence-restricted quantifiers. Thus,

$$(\Sigma x)A =_{Df} (Px)(x\Diamond \;\&\; A) \text{ and } (\Pi x)A =_{Df} {\sim}(\Sigma x){\sim}A.$$

Hence $\vdash (\Pi x)A \equiv (x)(x\Diamond \supset A)$. It also follows, $\vdash (\Pi x)(x\Diamond \supset A) \equiv (\Pi x)A$ and $\vdash (\Sigma x)(x\Diamond \;\&\; A) \equiv (\Sigma x)A$, thus refuting the claim (of SE, p.250) that such theses 'are not derivable from relations connecting [Π and Σ] with more extensive unrestricted quantifiers of a consistent standard system'. Within $Q\Diamond$ various possibility restricted logics can be represented. For example, free possibility quantification logic $F\Diamond Q$, which is exactly like free logic FQ except that $\Diamond$ replaces E throughout, is included in $Q\Diamond$. By a mere syntactical transformation of the argument that shows that QE is a conservative extension of FQ, $Q\Diamond$ is a conservative extension of $F\Diamond Q$. The distinctive "free" theses of $F\Diamond Q$ are, of course, $(\Pi x)x\Diamond$ and $t\Diamond \supset (\Pi x)A \supset A(t/x)$. The theses suggest the way in which a smaller system PQ, which captures the theses of $F\Diamond Q$ without $\Diamond$, can be obtained; namely replace the distinctive theses by the single axiom scheme

R2 $(\Pi x)A \supset A(t/x)$,

provided t is a consistent term. A term 't' is a consistent term if 't' signifies a possible object, i.e. if (as explicated in SE, p.254) it is possible that 't' has a referent. Both Q◊ and F◊Q are conservative extensions of PQ.

The system PQE, or $\underset{\sim}{R}^*$ for short, which adds constant E to PQ, may like PQ itself, be axiomatised as follows, with $\underset{\sim}{R2}$ as before:

$\underset{\sim}{RQ}$ $\vdash$ A, where A is truth-functionally valid.
$\underset{\sim}{R1}$ $(\Pi x)(A \supset B) \supset. A \supset (\Pi x)B$, provided x is not free in A.
$\underset{\sim}{RR1}$ (MO) $A, A \supset B \twoheadrightarrow B$.
RR2 (Gen) $A \twoheadrightarrow (\Pi x)A$.

Thus $\underset{\sim}{R}^*$ is tantamount to the system R^*, investigated in SE, which is also the basis of EI and NE.[1] (Hence those investigations can be absorbed at this stage.) Since $\underset{\sim}{R}^*$ can be conservatively extended, in a way required by the theory of objects, why[2] did the investigations of SE start with R^* and adopt a metalinguistic restriction of substitution, as in $\underset{\sim}{R2}$, instead of taking the more satisfactory course of imposing a systemic restriction on $\underset{\sim}{R2}$ with t◊ as an explicit condition. As a matter of historical fact, the original logical theory of SE was simply neutral logic QE; the paper was rewritten after early presentations to avoid apparent inconsistencies in interpretation, more explicitly, to meet the objections discussed in SE, pp.259-60. The argument there presented - that extensions to quantifiable domains containing possibilia is the maximum admissible extension that can be made while retaining the formalism (reinterpreted of course) of standard quantification logic - is inconclusive. It depends on the assumption that impossible objects such as Primecharlie, the first even prime greater than two, really do have classically inconsistent properties, that for some predicate, f, Primecharlie f and also ~Primecharlie f, thus violating the thesis (x)~(xf & ~xf) and rendering systems such as QE inconsistent, and so (classically) trivial. It is indeed true that any system that contains radically inconsistent objects, e.g. an a such that af and also ~af, has to be nonclassical in form, not just a reinterpretation of classical syntax (as SE p.260 begins to explain). But the argument for the assumption is inconclusive (as already explained above p.84 ff); it relies on some such mistaken - but very common - premiss as that impossible objects satisfy either a full characterisation postulate, in which case classical argumentation would show that both "Primecharlie is prime" and its negation are true, or else no characterisation postulate, in which case neither is true. As will become increasingly evident characterisation principles are not all-or-nothing matters; rather some predicates are assumptible and some are not. Moreover even if a characterisation principle ensures that both Primecharlie is prime and also (derivatively) that Primecharlie is not prime, it does not follow from the latter, given the distinction between predicate and sentence negation, that it is not the case that Primecharlie is prime. The argument of SE accordingly fails. Naturally puzzles about inconsistent objects are not disposed of quite so easily, and the question will occur as to whether such systems as Q◊E make adequate allowance for such objects: the eventual conclusion arrived at will be that they do not (see especially §23 and chapter 5, §2).

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[1] There is one apparent difference between systems R^* and $\underset{\sim}{R}^*$, namely that R^* admits instantiation in $\underset{\sim}{R2}$ by any variables (accounted in SE "individual variables" though no such interpretational restriction is required, or makes any difference in most applications). But in a good sense any variable "is consistent", i.e. admits of replacement by a consistent constant, so a restriction to consistent variables is really no restriction (in a system which contains subject constants).

[2] To ask an apparently idiosyncratic question about one's own work, but really to raise a question of much more general interest in a particular personal setting. The question is that already considered in some detail on p.84.

4. Predicate negation and its applications. There is, at first sight, a serious logical problem as to what logical laws do hold for possibilia and impossibilia? Some certainly seem to hold for both, e.g. the law of identity: if A then A. But as regards other important laws we seem to have reached an impasse. The Law of Non-Contradiction (LNC) for instance, both seems very plausible, can be impeccably defended semantically and has been adopted in Q and extensions, and yet seems to fail for impossibilia. Can we accept it as a law in any form, or should we reject it entirely? An escape can be made from this impasse - still within the framework of a consistent theory - though natural language distinctions between predicate connectives and sentence connectives, and in particular using the distinction, already indicated, between predicate negation and sentence negation. For the arguments presented in favour of abandoning such "negation" laws as LNC and the Law of Excluded Middle (LEM) only hold provided that negations of significant sentences are taken to be of just one sort, the sort represented in classical logic, and fail when that assumption is removed (as already explained, p.88 ff).

The point and importance of predicate negation, and its generalisation internal negation, and the reasons for its introduction into the logical theory have also been explained (p.89 ff.), through arguments from natural language, from Meinong's intuitive theory and assignments, from features of inconsistency and incompleteness of objects, and from parallels in classical theories of descriptions.[1] There is a solid case then for the introduction of predicate negation, and once it is introduced a start can be made on formulating logical principles for possibilia and impossibilia (as on p.89). It should be emphasized that it is hardly to be expected that the primitives of classical extensional logic are adequate to the logic of the nonexistent and the intensional. It is thus a decidedly bad argument that, since classical logic does not contain such primitives, they should not be introduced.

The negation symbol, ~, already among the symbols of Q, can be enlisted to play the role of predicate negation. So there is no need to enlarge the stock of symbols of Q, and extensions so far considered, to cater for predicate negation. For the morphology of $Q^{\sim}$, Q with predicate negation, it is enough to add the formation rule:

Where h is a predicate parameter, so is ~h; or, more specifically, where h^n is an n-place predicate parameter (variable or constant), $\sim h^n$ is also an n-place predicate parameter (correspondingly variable or constant).[1]

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[1] There is also firm historical basis for the distinction in traditional logical theory. As John Passmore pointed out, the article on Negation in Baldwin's Dictionary of Philosophy and Psychology 01-05 begins from a distinction between negations which deny the predicate and negations which deny the proposition. Recognition of a difference between external and internal negation goes back at least as far as Abelard, who was especially interested in the difference between *Non quidam homo est iustus* and *Quidam homo non est iustus* (see Kneale^2 62, p.210).

Similarly for other logics than Q. Much as $\sim A$ is the sentence negation of A, $\underset{\sim}{t}{\sim}f$ (i.e. $(t_1,\ldots,t_n){\sim}f^n$ for suitable n) is the predicate negation of $\underset{\sim}{t}f$. It would be quite possible to introduce instead of predicate negation $\sim$, an intensional negation - applying to all wff (cf. p.92). In general such an internal negation would (or could) extend the role of predicate negation from initial wff to all wff; but within the framework of logics so far considered which contain only extensional sentence connectives there is little point in resorting to internal negation.[2] However with richer logics differences appear which increase the advantages of internal negation, at the apparent cost however of losing contact with a single negation as in $Q^{\sim}$, which appears to fit in well with natural language (seen superficially, for consider the wealth of negative prefixes such an un-, dis-, etc.).

Several principles which hold for sentence negation, e.g. LNC and LEM, fail when recast in terms of predicate negation (p.88 ff.); so too then do Carnap's proposals for reducing predicate connectives to sentential ones (MN and elsewhere). However an important question for the logic, and semantics, of $Q^{\sim}$ (and generally for logic $L^{\sim}$) is which principles hold for predicate negation. The hardest principles, which appear impervious to counterexamples, are double negation laws

$DN^{\sim}$. $\underset{\sim}{t}{\sim}{\sim}h \equiv \underset{\sim}{t}h$.

While many examples appear to support forms of contraposition, e.g.

$CP^{\sim}$. $\underset{\sim}{t}{\sim}f \supset \underset{\sim}{u}{\sim}g \equiv. \underset{\sim}{u}g \supset \underset{\sim}{t}f$,

and thus its specialisation $\underset{\sim}{t}{\sim}f \supset \underset{\sim}{t}{\sim}g \supset. \underset{\sim}{t}g \supset \underset{\sim}{t}f$, the principles are in doubt for at least these reasons, and so should be rejected. Firstly, $CP^{\sim}$ amounts to ${\sim}\underset{\sim}{t}{\sim}f \vee \underset{\sim}{u}{\sim}g \equiv. \underset{\sim}{t}f \vee {\sim}\underset{\sim}{u}g$. Since $\underset{\sim}{t}f$ and $\underset{\sim}{u}g$ can vary independently, such an equivalence could be true only if there were connections, equivalences or at least material implications, between respective components of the equivalence, e.g. ${\sim}\underset{\sim}{t}{\sim}f$ and $\underset{\sim}{t}{\sim}f$. But requisite connections between such components fail, as we have seen; ${\sim}\underset{\sim}{t}{\sim}f$ neither implies nor is implied by $\underset{\sim}{t}f$. Secondly, from the positive paradox, $A \supset. B \supset A$,[3] it follows, $x{\sim}f \supset. y{\sim}g \supset x{\sim}f$. Thus applying $CP^{\sim}$, $x{\sim}f \supset. yg$ results. But now for any impossibilium x some property λf can be found such that xf is true and $x{\sim}f$

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[1] Use of a schematic formulation of Q comes to matter. With a finite axiom formulation, e.g. a neutral version of Church's system F_2^{1p} of 56, p.218 ff., it would be necessary to reformulate the logical structure, to complicate the rule of substitution for predicate variables.

[2] Using predicate negation an internal negation can be defined for $Q^{\sim}$, as follows: where A is an initial wff $\underset{\sim}{t}f$, $\bar{A}$ is $\underset{\sim}{t}{\sim}f$; where A is of the form $\sim B$, $\bar{A}$ is B; where A is of the form B & C, $\bar{A}$ is $\bar{B} \vee \bar{C}$; etc.

[3] The second reason really puts the first in more damaging form, that the usual justification for classical principles with (sentence) negation breaks down for predicate negation. Thus, e.g., the outcome of $A \supset. B \supset A$, namely $x{\sim}f \supset. xf \supset q$, no longer has the usual vindication got by replacement of material implication by alternation and negation. For it becomes under replacement: ${\sim}x{\sim}f \vee. {\sim}xf \vee q$. Since ${\sim}x{\sim}f$ does not reduce to xf the formula does not hold generally.

is also true. So, for instance, it follows by substitution: mrs ~ round ⊃. mrs round ⊃. yg, whence, by detachment of truths (namely (1) and (2) of p.47), yg is true. The upshot is that with $CP^{\sim}$ the logic would be absolutely inconsistent. Damaging consequences also follow using the special case in place of $CP^{\sim}$; for example it then follows that any impossibilium possesses all properties![1] As similar methods show, several other negation principles fail for predicate negation, e.g. reductio, antilogism, disjunctive syllogism. The main condition constraining predicate negation appears then to be double negation, which will be taken as sole axiom scheme for predicate negation.

$Q^{\sim}$ is axiomatised then by the postulates of Q together with DN. Similarly extensions of Q such as QE, simply add DN as a postulate. The elementariness of the new axiom makes it easy to enlarge the semantics for Q (or its extensions) to include predicate negation. On the first and simplest method, $t{\sim}^{n}f$ (with $n \geqslant 1$ and parameter f containing no occurrences of ~) is assigned arbitrarily subject to the restrictions that where n is even $t{\sim}^{n}f$ is assigned the same value as $\underset{\sim}{t}f$ and where n is odd and greater than 1 $\underset{\sim}{t}{\sim}^{n}f$ is assigned the same value as $\underset{\sim}{t}{\sim}f$. $\underset{\sim}{t}{\sim}^{n}f$ is of course defined recursively, e.g. thus $\underset{\sim}{t}{\sim}^{1}f =_{Df} \underset{\sim}{t}{\sim}f$; $\underset{\sim}{t}{\sim}^{n+1}f = \underset{\sim}{\tilde{t}}{\sim}({\sim}^{n})f$. The assignment method is effective since n is always finite. What all this amounts to then is that $\underset{\sim}{t}{\sim}f$ is assigned independently of $\underset{\sim}{t}f$, as if it were an initial wff, and wff containing interated occurrences of predicate negation are reduced respectively to $\underset{\sim}{t}f$ or $\underset{\sim}{t}{\sim}f$ according as the number of negation signs is even or odd.

To sum it up more satisfactorily, in truth-value semantics, $I(\underset{\sim}{t}{\sim}h, T) = 1$ or 0 according as the model assigns, just as for initial wff, subject only to the requirement that $I(\underset{\sim}{t}{\sim\sim}h, T) = I(\underset{\sim}{t}h, T)$. As before, in objectual semantics, $I((t_1,\ldots,t_m){\sim}h, T) = 1$ iff $<I(t_1),\ldots,I(t_n)> \in I({\sim}h, T)$, where $I({\sim}h, T)$ is assigned by the model just as for $I(f, T)$, unnegated f, the requirement being that $I({\sim\sim}h, T) = I(h, T)$.

A second and more flexible semantics, which removes any numerical aspect (through an involutory function which takes over their role), is provided by the † method. To the models (or model structures) of the underlying logic, e.g. Q, QE or whatever, an operation † is added, subject to the involutory requirement that $a^{\dagger\dagger} = a$ where a is any element formed from T by application of operation †. Thus, for example, a $Q^{\sim}$ model is a structure $<T, \dagger, D, I>$ with † an operation (on T and † successors) such that $a^{\dagger\dagger} = a$. Since $a^{\dagger\dagger} = a$ the model is really a two worlds one with worlds T and $\perp = T^{\dagger}$; and using model $<T, \perp, D, I>$ simplifies the interpretation rules. Initial assignments are made, as for the underlying logic, only to negation-free wff. But initial wff are assigned values, independently, at both T and ⊥. The further evaluation rules for operators of the underlying logic are as before, the rules applying only at T. The additional rules for predicate negation are as follows:

$I(\underset{\sim}{t}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}h, \perp) \neq 1$.

$I(\underset{\sim}{t}{\sim}h, \perp) = 1$ iff $I(\underset{\sim}{t}h, T) \neq 1$.

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[1] The damage is really done by a combination of the contraposition principles with material connectives. Thus if contraposition principles, which have some appeal and support, are to be retained, then (as argued in EMJ1), material implication cannot be retained without very ugly consequences. There is, however, no problem in dispensing with material implication; for material implication is so implausible in so many directions as more than a necessary condition on a satisfactory implication that there are many independent reasons for displacing it from its usual prominent position.

1.17 ADEQUACY ARGUMENTS FOR PREDICATE NEGATION LOGIC

Adequacy proofs are enlargements of those for the underlying logic. Consider the first semantics,

<u>ad</u> Soundness: It suffices to validate $DN^{\sim}$, for which it suffices to show in an arbitrary model that $I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}h, T) = 1$. But this is immediate from the assignment rules; for in the objectual case

$I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $<I(t_1),\ldots,I(t_n)>$ i $I({\sim}{\sim}h, T)$, i.e. iff $<I(t_1),\ldots,I(t_n)>$ i $I(h, T)$, i.e. iff $I(\underset{\sim}{t}h, T) = 1$, where $\underset{\sim}{t} = <t_1,\ldots,t_n>$, since $I({\sim}{\sim}h, T) = I(h, T)$.

<u>ad</u> Completeness: The completeness proof is as for the underlying logic, and this enables the requirement $I(\underset{\sim}{t}{\sim}{\sim}h, T) = I(\underset{\sim}{t}h, T)$ to be established, whence $I({\sim}{\sim}h, T) = I(h, T)$ will follow. For $I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $\underset{\sim}{t}{\sim}{\sim}h \in T$ and $I(\underset{\sim}{t}h, T) = 1$ iff $\underset{\sim}{t}h \in T$. But as T is closed under material implication and contains all theorems, by $DN^{\sim}$,

$\underset{\sim}{t}h \in T$ iff $\underset{\sim}{t}{\sim}{\sim}h \in T$.

Consider now the second semantics.

<u>ad</u> Soundness: As in the first case it suffices to show generally that $I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}h, T) = 1$. But $I(\underset{\sim}{t}{\sim}{\sim}h, T) = 1$ iff $I(\underset{\sim}{t}{\sim}h, \perp) = 1$, i.e. iff $I(\underset{\sim}{t}h, T) = 1$.

<u>ad</u> Completeness: T is constructed as for the underlying logic; similarly D and I are as before except that it is also specified that $I(\underset{\sim}{t}h, \perp) = 1$ iff $\underset{\sim}{t}h \in \perp$, where $\perp$ is defined as the class of wff of the form $\underset{\sim}{t}h$ such that $\underset{\sim}{t}{\sim}h \notin T$. Hence $\underset{\sim}{t}h \notin \perp$ iff $\underset{\sim}{t}{\sim}h \in T$. It suffices, given the completeness argument for the underlying logic to verify the evaluation rules for predicate negation. There are two cases.

(i) $I(\underset{\sim}{t}{\sim}h, T) = 1$ iff $\underset{\sim}{t}{\sim}h \in T$ iff $\underset{\sim}{t}h \notin \perp$ iff $I(\underset{\sim}{t}h, \perp) \neq 1$;

(ii) $I(\underset{\sim}{t}{\sim}h, \perp) = 1$ iff $\underset{\sim}{t}{\sim}h \in \perp$ iff $\underset{\sim}{t}{\sim}{\sim}h \notin T$. But $\underset{\sim}{t}{\sim}{\sim}h \notin T$ iff $\underset{\sim}{t}h \notin T$, by $DN^{\sim}$. And $\underset{\sim}{t}h \in T$ iff $I(\underset{\sim}{t}h, T) = 1$.

Evidently $\perp$ has a very limited role in the second semantics. It is better adjusted to the treatment of internal negation, which applies to all wff. Also the method is better suited to, and comes into its own in the intensional scene which usually begins with infinitely many worlds, so that † can be directly defined without any need to form a sequence of worlds beginning with T (see below, and also RLR chapter 7). The method is much more flexible than that of the first semantics in that it can readily accommodate further axiomatic conditions on predicate negation. But it is easy to see from the semantics that proposed principles such as $CP^{\sim}$, which get duly falsified by countermodels, are undesirable. A countermodel to $x{\sim}f \supset y{\sim}g \supset.\ yg \supset xf$ is obtained by searching for a falsifying situation. Thus suppose it is false in a model; what is that model like? Well, $I(x{\sim}f \supset y{\sim}g, \perp) = 1$ and $I(yg \supset xf, T) \neq 1$, so $I(yg, T) = 1 \neq T(xf, T)$. And either $I(x{\sim}f, T) \neq 1$ or $I(y{\sim}g, T) = 1$, i.e. $I(xf, \perp) = 1$ or $I(yg, \perp) \neq 1$. But, in truth-valued semantics such assignments are perfectly admissible. Choose I then so that it gives such assignments; the resulting model falsifies $\underset{\sim}{CP}$.

This completes the elementary logic of predicate negation: the logic is however elaborated upon in subsequent sections, e.g. it is linked with property and attribute negation in §18 and synthesized with internal negation in §23. The main applications of predicate negation have already been indicated (p.88 ff), but the main point bears repetition.

Predicate negation is fundamental in the (consistent) theory of items for the characterisation of inconsistency and incompleteness, and thus in the determination of what is impossible and what merely possible. Inconsistency and incompleteness, with respect to predicate negation,[1] are defined thus:

x is inconsistent wrt f $=_{Df}$ xf & x~f.

(As always 'wrt' abbreviates 'with respect to'). Similarly defined are: xf is inconsistent and f is inconsistent at x.

x is incomplete wrt f $=_{Df}$ ~xf & ~x~f.

Similarly defined are: xf is incomplete and f is incomplete at x.[2] Evidently x is inconsistent [indeterminate or incomplete] iff x is inconsistent [incomplete] wrt *some* (extensional) f. But saying this in the theory requires quantification over predicates, which exceeds first-order resources. There are resource inadequacies nearer home. For example, it is a logically significant question, preanalytically, whether if xf is incomplete its negation ~xf is also. But the definition given does not permit us to pursue it; for ~xf is incomplete is not defined. Of course we could define it separately, but what is really wanted is a single definition that extends to it and other cases without further definitional ado. Since this can be achieved with internal negation, it is another reason for considering generalising from predicate to internal negation, i.e. to introducing a connective - (as on p.92) subject to the semantical rule: $I(\bar{A}, a) = 1$ iff $I(A, a^{\dagger}) \neq 1$. Such a connective is included in the richer logics of later sections (especially §23).

The connection between the joint falsity of contraries and nonexistence was observed by Aristotle though in the context of a different theory. Concerning the contraries 'Socrates is well' and 'Socrates is ill' (i.e. 'Socrates is not well'), Aristotle said (*Categories*, 10, 14a12 f.),

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[1] Parallel notions may be defined with respect to other operators. There are of course further sorts of incompleteness and inconsistency than purely negation types: ω-inconsistency (p.95) is one, and various sorts of ω-incompleteness and ω-indeterminacy may be defined.

[2] Though there is sometimes point in separating incompleteness and indeterminacy - similarly inconsistency and overdeterminacy - commonly no separation is made and often the terms are used interchangeably. The following terminology is however appealing: an object is indeterminate if it is incomplete in some respect.

Once the logic of these notions is better understood however, and important differences emerge more clearly, there will be point in regular separation. For example, there is one incompleteness determinate such that the complement of an incomplete object is inconsistent (e.g. worlds a and a^*), but there is another important incompleteness determinate such that the complement of an incomplete object is incomplete.

> if Socrates exists, one will be true and the other false, but if he does not exist, both will be false; for neither 'Socrates is ill' nor 'Socrates is well' is true, if Socrates does not exist at all.

Elaboration of the logical interconnections between negation and existence and possibility leads directly to a more sophisticated treatment of both existence and possibility, to the second stage account of §19.

5. Descriptors, neutral choice operators, and the extensional elimination of quantifiers. Just as important as quantifiers, but by comparison neglected in modern logical theory, are descriptors. Whereas in standard logic quantifiers are sentence (or wff) forming in sentences (or wff), descriptors are subject forming on sentences or wff. But in natural languages such as English that neat distinction is eroded; both types of operators apply to general terms to yield subjects. For example, 'some', sometimes taken as a paradigmatic quantifier, applies to singular or plural terms to (e.g. 'man' or 'men') to yield a singular or plural (indefinite) subject. Better representatives of natural language quantifiers (though of course no variables are involved) are 'there is (a)', 'there exist' and, differently, 'something (is a)' and 'every object (is a)'; but some of these (e.g. 'something') are made up from descriptors. Perhaps indeed all quantifiers can be defined in terms of descriptors? So it proved to be in the case of classical extensional logic: the main quantifiers can be defined in terms of one very important descriptor, Hilbert's epsilon operator or choice symbol.

The role and importance of descriptors, especially in ordinary discourse, and so in any logical theory that aims to reflect and work out the logic(s) of ordinary discourse, is explained in Slog (p.151 ff. p.553 ff.) and also in PLO (p.156 ff.) which at the same time indicates how a neutral choice operator gets into the picture; the logic and role of Hilbert's epsilon ε is well explained with its original presentation in Hilbert-Bernays 39, but briefer expositions may be found in Kneebone 63 (p.100 ff.) and Wang 63 (p.315 ff.), while the Hilbert consistency programme using ε is explained in Kleene 52. Hilbert's epsilon operator itself is not what is wanted or sought in a theory of items; for it is existentially-loaded, as is shown, firstly by the definition of the existential quantifier $\exists$ in terms of ε (thus: $\exists xA =_{Df} A(\varepsilon xA)$), and secondly by the intended interpretation of $\varepsilon xA(x)$, as an arbitrarily selected entity which is A if there exists one and an arbitrarily selected entity otherwise (cf. Asser 57). What is sought as a basic operator is a neutral analogue of Hilbert's operator, and such is provided by the xi, ξ, operator (studied in Routley 69, Slog, p.554 ff. and especially PLO, p.181 ff.).[1]

A logic $L\xi$ with choice results from earlier logics such as SQ, Q, QE, $QE^{\sim}$ by addition of a term-forming operator ξ. That is to say, ξ is added as a primitive symbol, and is subject to the formation rule: where A is a wff and x a subject variable, then ξxA is a wf term (and occurrences of x in ξxA are bound). $L\xi$ has just one axiom scheme beyond those of L, the xi scheme

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[1] By good fortune what started life supposedly as an epsilon symbol was interpreted by typists as a xi symbol. So do we profit from error.

Aξ. $B(t/x) \supset B(\xi yB(y/x)/x)$, or for short, $B(t) \supset B(\xi yB)$.[1]

The point of the baffling substitution notation is two-fold: to facilitate change of variables bound by ξ, and to ensure that variables are not illegitimately bound up upon substitution. Aξ tells us that where B holds for some term t then it holds for any object (an arbitrarily selected item) which is B. It is such construals of Aξ, along with the intended interpretation, that encourage the reading of ξ as 'any'. But really ξ is an artificial determinate of the English determinable 'any', in something the way that P and U are of corresponding English quantifiers.

Since the logic and semantics of ξ are presented in requisite detail elsewhere (see, e.g., texts already cited) it is enough to summarise the more remarkable features and results. Firstly, ξ enables the definition and elimination of quantifiers. Neutral quantifiers may be defined in terms of ξ as follows: $(Px)B =_{Df} B(\xi xB)$; $(Ux)B =_{Df} \sim(Px)\sim B$. Then where L is a zero-order logic (e.g. SQ), Lξ (with quantifiers defined as above) includes LQ; e.g. SQξ includes Q, i.e. if A is a theorem of SQξ then A is a theorem of Q. Correspondingly, in Qξ the above definitions are provable in equivalential form, e.g. $(Px)B \equiv B(\xi xB)$ is a theorm of Qξ. More striking than the extension results, is that the extension is a conservative one, e.g. SQξ conservatively extends Q, that is where A is a wff of Q, A is a theorem of SQξ (with quantifiers defined) iff A is a theorem of Q. This is a neutral version of part of the substance of the second epsilon theorem.[2] The corresponding part of the first epsilon theorem is that SQξ is a conservative extension of SQ, that is the addition of ξ does not deliver any new purely sentential or zero-order results.

The simplest proofs of ξ theorems make use of semantics of ξ logics, which there is independent point in considering. Intuitively, ξxA(x) is an arbitrarily chosen item of the domain given satisfying A(x) if some item does satisfy A. The problem is, what assignment to make, if any, if no item satisfies A; and what succeeds is the following: an arbitrarily chosen item of the domain.[3] These assignments can be spruced up formally by adding to modellings a choice function c, as now illustrated in the case of SQξ. An SQξ model M is a structured set $M = \langle T, D, c, I\rangle$ where T and D are as before, and c is a choice function over D such that for each non-null subject D' of D, c(D') is an item of D' and such that otherwise $c(D') = c(\Lambda) = c(D)$. Interpretation I is as before but there is an additional clause for ξ terms, namely

$$I(\xi xA) = c\{I(x):I(A,T) = 1\}.$$

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[1] Note that since descriptor ξ binds variables, the explanation of B(t/x) is extended to include such bindings by descriptors. The substitution notation is fully explained in Routley 69.

[2] The full second epsilon theorem applies not only to quantification logic and quantification logic with identity but to certain quantificational theories.

[3] It is not necessary to make an assignment: Henkin in 50 does not.

Note that in neutral logic it is not really necessary either to exclude null domains. The null set can be pressed into service in such cases, if in a somewhat Alice-in-Wonderlandish way. In particular, if $D = \Lambda$, $c(D) = \Lambda$.

Validity, satisfiability, and so on, are defined in the usual way (e.g. as in §§15-16). Expected adequacy theorems, Skolem-Lowenheim theorems, compactness theorems, and so forth now follow for SQξ, SQEξ, Qξ, QEξ, etc. (Main details may be found in Routley 69, p.148 ff.; three valued versions of the results are presented in Slog, p.554 ff.; and intensional versions in PLO, p.190 ff.) The adequacy theorems may be applied to yield the neutral versions of Hilbert's epsilon theorems stated above.

Just as existentially-loaded quantifiers can be defined in neutral quantification logic with existence - only they satisfy the more liberal free logic, and not classical logic, except where domains are existentially-restricted - so a Hilbert epsilon operator can be defined in neutral choice theory with existence - only it will conform to a more liberal free epsilon theory, which only reduces to the Hilbert theory where domains are artificially existentially restricted. Just as $\exists$ is defined: $(\exists x)A =_{Df} (Px)(xE \,\&\, A)$, so ε is defined: $\varepsilon xA =_{Df} \xi x(xE \,\&\, A)$. The principles which govern ε, namely

$\varepsilon 1.$ $A(x) \,\&\, xE \supset. A(\varepsilon xA)$

(cf. FEG), and

$\varepsilon 2.$ $A(x) \,\&\, xE \supset. (\varepsilon xA)E$,

follow at once from Aξ, upon taking $B(x)$ as $A(x) \,\&\, xE$. It is evident from the way ε can be interpreted that ε coincides with Hilbert's operator. For εxA signifies an arbitrarily chosen entity which satisfies A provided there exists an element satisfying A.[1]

The logic SQξ, obtained by the addition of $\varepsilon 1$ and $\varepsilon 2$ to zero-order logic SQ, does not however neatly include free quantificational logic, something that might at first be expected. For although the FEG scheme $A(x) \,\&\, xE \supset (\exists x)A$ follows at once from ξ1 upon defining $(\exists x)A =_{Df} A(\varepsilon xA)$, the other characteristic free axiom, $(\forall x)xE$, i.e. $\sim(\exists x)\sim xE$, does not follow. On the contrary, since it amounts to $(\varepsilon x\sim xE)E$ (i.e. under translation $(\xi x(xE \,\&\, \sim xE))E$), countermodels are easily supplied in domains which include nonentities. Of course free logic is recoverable in SQEξ in the usual way (e.g. as in §16).

Because ξ logics enable the elimination of quantifiers by way of terms they facilitate quantificational deductive procedures, especially natural deduction techniques which rely on arbitrarily selected terms satisfying given conditions (hence the simple natural deduction systems of Routley 69); for similar reasons they often simplify tasks, such as proving consistency of theories, where quantifiers cause problems. ξ terms also prove to be important in explaining or defining other descriptors such as 'the' (see §22) and in formulating distinctive logical principles of the theory of items, namely Characterisation Principles (§21).

Despite the big advantages of ξ terms, and the attractiveness of the theory they lead to, such terms make for serious difficulties in intentional logics (as will become evident subsequently). But logical development of the theory of objects soon forces us to intensional logics.

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[1] The Henkin interpretation previously mentioned is here exploited.

6. Identity determinates, and extensionality. The standard logical theory of identity can of course be adjoined to any of the logics already studied. Since identity cannot be defined in first-order quantification logics, identity predicates have either to be introduced as further predicates or two-place predicate constants have to be singled out to do the jobs.

The postulates on Leibnitz identity, $\approx$, are entirely standard; they are

$\approx$1. $u \approx u$

$\approx$2. $u \approx v \supset . A(u) \supset A(v)$, where u and v are subject terms and $A(v)$ results from $A(u)$ by replacing one (derivatively zero or more) occurrence of u by v, and this occurrence is not within the scope of quantifiers or descriptors binding (variables in) u or v (proviso I).

It is enough to state scheme $\approx$2 for initial wff since the full scheme can be recovered by an inductive argument.

To extend the semantics already given to cover Leibnitz identity, requires only an evaluation rule for $\approx$, and in objectual form[1] it is as follows:

$I(t_1 \approx t_2, T) = 1$ iff $I(t_1)$ is the same (object) as $I(t_2)$, i.e. $I(t_1)$ and $I(t_2)$ are Leibnitz identical.

The rule is splendidly circular in its own way, but adequate. Proofs of adequacy are orthodox elaborations of those already indicated for the logics to which identity is added: soundness is straightforward, while completeness typically uses an equivalence class method.[2]

The important identity determinates are extensional, strict and coentailmental determinates, not Leibnitz identity. In limited contexts such as those of extensional or modal logic (contexts logicians and some mathematicians confine themselves to), Leibnitz identity can stand in for an important determinate. Hence its usefulness. It has too a role as an ideal limit, the limit as more and more restrictions on intersubstitution are removed. But for philosophical purposes, and for the logical analysis and assessments of ordinary discourse and arguments, neither of which are confined to the extensional or modal and are rarely so restricted, Leibnitz identity is not important, but indeed a major hindrance, particularly when presented, as classical logicians and exponents of the Reference Theory like to present it, as the one true identity.

Nothing (except an explicit interpretational restriction) bars the interpretation of predicates of quantification logic as intensional predicates. Under such circumstances, extensional identity cannot be equated with Leibnitz identity, even in the relatively impoverished language of 2$\approx$ (i.e. quantificational logic with Leibnitz identity). The question arises: How in such a setting can extensional identity be introduced in a not merely interpretational fashion? There is no prospect of splitting intensional predicates into two components, an intensional connective combined with an extensional predicate, as is commonly done in modal logic, since the language has no place for intensional connectives. One evident course is to divide predicates into two classes, extensional and not, but better than two sets of primitive predicates is the introduction of one further predicate (of predicates) ext, abbreviating 'the predicate '...' is extensional', and conforming to the formation rule: iff f^n is a predicate then ext(f^n) is a wff. Strictly the predicate ext exceeds the resources of first-order logic; but the violation is minor, and could be removed by (e.g. by pretending that ext is a special subject).

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[1] By comparison, the rule in substitutional or truth-valued form is disagreeably complex. Substitutional semantics are ill-adapted for the semantical analysis of subsentential parts of speech.

[2] For details see, e.g. Slog, p.534 ff., where features, and shortcomings, of Leibnitz identity are also discussed, especially, p.606 ff.

Predicates are not only extensional or not in toto, but, where the predicates are of more than one-place, extensional or not in each place. Whether a predicate is extensional in a given place is often important for whether identity replacement can be made within it. Accordingly ext is superseded by ext_i, extensional in the ith place. Where f^n is a n-place predicate and $1 \leqslant i \leqslant n$ then $\mathrm{ext}_i(f^n)$ is a wff. Ext is then defined as complete extensionality, thus $\mathrm{ext}(f^n) =_{Df} \mathrm{ext}_1(f^n)\ \&\ldots\&\ \mathrm{ext}_n(f^n)$.

Ext may be extended to all wff (e.g. of Q) recursively as follows:- ext(~A) iff extA; ext(A & B) iff extA and extB; ext((x)A) iff, (for every x, ext(A). These rules reflect what can be proved given definitions of extensional for functions of functions (see, e.g. 10.1), e.g. ext(A & B) ≡ extA & extB; etc. It follows that in Q, for instance, intensionality only enters at the level of predicate expresions: for the remainder, the logic, and its connectives and quantifiers, are already extensional.

Extensional identity, =, conforms to the formation condition: where u and v are subjects terms (u = v) is a wff. The basic extensional identity axioms are

=1. $u = u$;

=2B. $u = v\ \&\ \mathrm{ext}_i f^n \supset.\ \underset{i^{th}\text{ place}}{(\ldots u \ldots)}\, f^n \supset \underset{i^{th}}{(\ldots v \ldots)}\, f^n$,

i.e. where f^n is extensional in the ith place, intersubstitution can be made at that place. A scheme corresponding to the scheme adopted for Leibnitz identity can now be derived inductively:-

=2. $u = v \supset.\ A(u) \equiv A(v)$, subject to the requirements of proviso (I) and the further requirement that the occurrence of u replaced is not within a nonextensional place of a predicate (proviso II).

Roughly, replacements of extensional identity preserves truth given that replacements are limited to extensional places.

In order, however, that such fundamental properties of identity as symmetry and transitivity be derived, a further postulate is required, namely

=3. ext(=).

Otherwise replacements of extensional identicals within identity contexts themselves is not legitimated. Given =3, symmetry and transitivity do follow using =2 and, in case of symmetry, = 1. Similar postulates are required for other predicate constants, e.g. where E is present,

=4. ext(E).[1]

When the logic contains descriptors such as ξ, further extensionality principles may suggest themselves, in particular, $A \equiv B \supset. \xi xA = \xi xB$, and variants theorem. But the principle is false, for the same reason as its derivative for definite descriptions already rejected in 1.14. Moreover the semantical theory affords countermodels to such principles.

But which predicates, it will be demanded, are extensional in which places? A good feel for which predicates are extensional and which are not can be given by way of examples. But can a distinguishing principle be found, or something more systematic given which reduces the need for lists of postulates? An informative answer might be hoped for from the semantical theory, developed, but is not forthcoming. For at best rather trivial semantics for ext can be provided in the extensionally-biassed semantical framework for Q and extensions thus far considered, e.g. $I(\text{ext } f, T) = 1$ iff f is extensional. For a less trivial semantics a more substantial semantical theory is required - a semantical theory invaluable in many other places - that for intensional logics.

7. Worlds Semantics: introduction and basic explanation. An explanation of worlds semantics is an essential prerequisite both for the informal theory elaborated subsequently and for the more formal semantical theory that can be appealed to in underpinning and clarifying the less formal theory. Since the time has come to introduce quantified modal logics and their semantical analysis in terms of possible worlds, a good time has come to interpose this basic explanation.

A world is an object, of a certain sort: it has certain domains, it stands in certain relations, for instance to other worlds. Most important, it is an object where statements (represented syntactically by declarative sentences) hold, or fail. The basic semantical relation, (that) A holds at (or in) world c is symbolised, in terms of η, holding at, $A \, \eta \, c$, or in terms of the on[e]ness of an interpretation function, thus: $I(A, c) = 1$. Here η will be taken as fundamental, and I defined: $I(A, c) =_{Df} A \, \eta \, c$. I is a function from WffXWorlds to holding values $\{1, 0\}$, i.e. from wff and worlds to holding values. I is certainly a function, since if A = B and c = d then $A \, \eta \, c$ iff $B \, \eta \, d$. Hence $I(A, c) \neq 1$ iff $A \, \not\eta \, c$: $I(A, c) \neq 1$ can be read, in the assumed two-valued semantical framework, where it is equated with $I(A, c) = 0$, A does not hold at c.

The interpretation function I - which in a weak sense does interpret wff at worlds - is expected to satisfy further conditions, ideally conditions which enable $I(A, a)$ to be inductively defined through initial cases, i.e. cases of the form $I(C, d)$ where C is an initial (or atomic) wff. The requirements for the (complete) possible worlds of modal logics make satisfaction of the inductive conditions easy, at least for &-∨-~ system. Specifically, a world c is a (complete) possible world iff for every wff A and B:

> $\sim A \, \eta \, c$ iff $A \, \not\eta \, c$, i.e. ~A holds at c iff A does not hold at c (the completeness and consistency requirements, of the classical negation rule)

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[1] Where functions are separately included in the logic axioms like =2B will be needed.

(A & B) η c iff A η c and B η c (normal &-rule)

(A $\vee$ B) η c iff A η c or B η c (normal $\vee$-rule).

Worlds may be represented through the sets of wff that hold in them. Given such a representation, the rules for possible worlds may be rewritten as membership rules, simply by replacing 'η' throughout by 'ε' (thus, e.g., the worlds of Hintikka developed from the state descriptions of Carnap).

Possible worlds, despite their prominence in recent semantical analysis, are a rather special class of worlds.[1] Subsequently (in §24) a rich variety of worlds that are neither complete nor possible will be considered. A most important subclass of these worlds consists of the worlds which differ from possible worlds only in removing one or both of the qualifications to completeness or possibility. Such are, in essentials, the normal worlds of relevant and entailment logics (discussed in §23).

Worlds, other than the actual world,[2] do not exist. There exists no world where poverty is abolished, no world where most of our lives are not organised in large measure in the interests of some form of capitalism, no world where the oceans and rivers are unpolluted. But many alternative worlds, none of which exist, have these desirable features. Of course alternative worlds are not featureless though none of them exist. Worlds are an important and clear example of objects which do not exist which are very useful theoretically. Since they do not exist, alternative worlds are neither discovered (e.g. through special long-range telescopes) nor stipulated (e.g. through special long-range telescopes) nor stipulated (e.g. like names); thus the dispute between Lewis and Kripke (cf. Kripke 71 and 72) about the character of possible worlds, over whether they are platonistically or conventionalistically discerned, presents a false contrast, based on a mistaken existence assumption. For similar reasons the many attempts to reduce alternative worlds to something else that does exist, in order to limit ontological commitments, are misguided.[3]

Among worlds the factual world T is especially important for the theory of truth (and also pedogogically) - even if T is usually eliminable in modal semantics. The factual world is of course such that just what is true holds at it: that is (applying a Tarski scheme of the form Tr A iff A), for every A,

A η T iff A. Indeed subsequently truth will be defined in terms of holding at T, i.e. (that) A is true iff I(A, T) = 1.

Worlds may be interrelated in many ways. For example, world a may include world b, i.e. b $\leqslant$ a, which happens if and only if for every C, if C η a then C η b. But there are many many other relations that worlds may stand in. A two-place relation R between worlds may be any suitable sort of relation: similarly for relations of more than two-places. For example, the semantics of modal logic S5 can be expressed using an equivalence relation R on worlds (i.e. a relation that is reflexive, symmetric and transitive); but it turns out that the relation can be eliminated by a slight adjustment of semantics.

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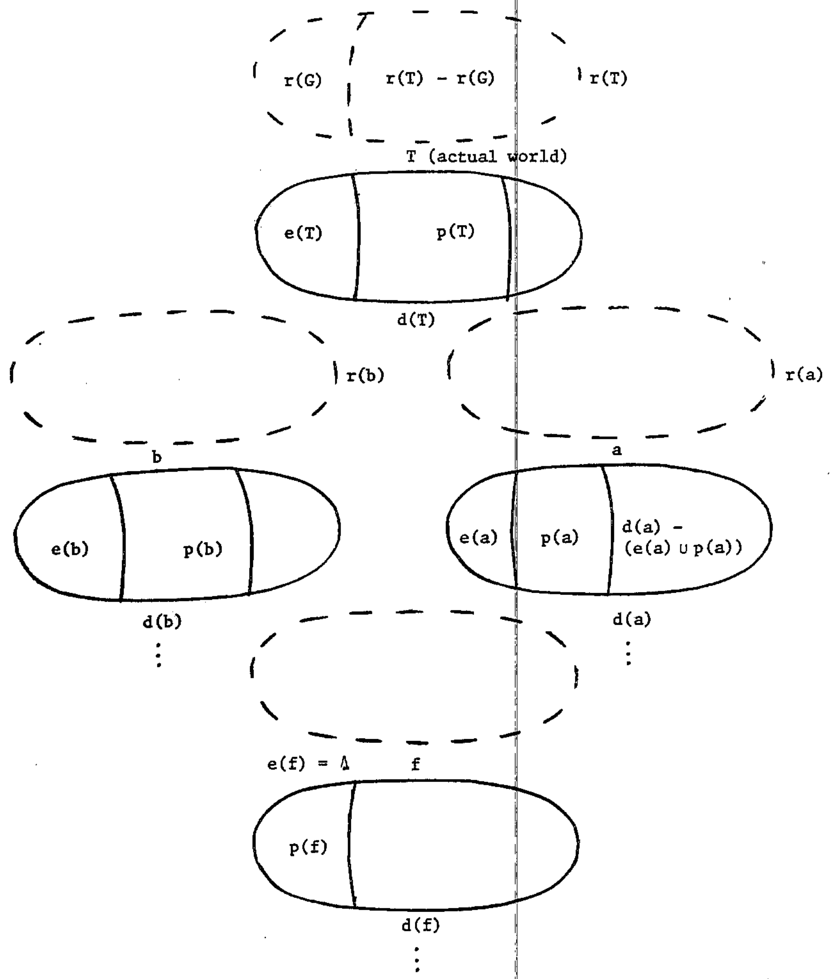
[1] An accurate history of the use and role of possible worlds and of modal logic semantics has yet to be written. What is clear enough is that such a history would differ substantially from the presently recieved picture.

[2] Whether the actual world exists depends on its further representation. As an abstract set of propositions it does not exist; reduced to an appropriately interrelated sum of things that exist it does exist.

[3] World reduction is a special case of object reduction, a matter further discussed in 12.3.

A world a may have various domains (associated with it), in particular the things of the world, i.e. the domain d(a) of objects. These domains will include various subdomains of importance, in particular d(a) will include the subdomain e(a) of entities of a, and also a subdomain p(a) of mere possibilia of a. Pictorial representation of worlds is helpful in indicating these domains.

Worlds picture (in Euclidean 2-space)



1.17 RANGES AND REFERENTIAL IMPOVERISHMENTS OF WORLDS

The relations between worlds are represented as geometrical relations. The picture, in black, has its limitations. Firstly, it depicts worlds primarily as totalities of things, each black ellipse representing a domain of objects, not (to use Wittgenstein's contrast in 22, and Lewis's in 23) as totalities of what is the case. However the picture can be complicated to indicate "Wittgenstein worlds". Such are the dashed ~~red~~ ellipses (or balloons) which show the range r(a) of each world a, where r(a) = {B: B η a}, i.e. the range of a is the class of statements that hold in a.[1] Secondly, the separation of the ranges and domains of worlds depicted is seriously misleading. Ranges of different worlds will stand in every elementary class relation, not only disjointness but inclusion (each way) and overlap. Wff A, for example, may hold in both T and in a but not in b or f, while B holds in T and a and f, and C holds in none of them. If worlds are restricted to possible worlds, ranges will always overlap, since every classical tautology holds in every possible world (as the rules for holding in possible worlds will show, since they simply reflect truth-table rules). Moreover domains of worlds will usually contain common elements (contrary to the exclusionist picture of D. Lewis 73) Pegasus may be an element both of d(T) and of e(a). Indeed, given that worlds are designed to model features of the one language (and its conceptual apparatus), it is to be expected that domains of worlds coincide, i.e. d(a) = d(b) for every a and b. For the language has a common store of terms which are about a fixed set of objects. Once however variation of languages over times (dynamic languages) are considered - or alternatively differences between speakers is brought out - the simple and plausible picture of a common domain of objects (not of entities) for all worlds, which works nicely for many static formal languages (and many of the systems studied below), may well require complication.

Associated with each world a is its referential impoverishment, a world c(a). What holds in c(a) consists of the referential statements (i.e. statements conforming to the canons of the Reference Theory) that hold in a, i.e. the range r(c(a)) comprises the referential subset of r(a). Correspondingly the domain of c(a) is e(a).[2] The (actual) referential world G, the one and only world according to most empiricists, is defined as c(T). Its range, in terms of which it can be represented, consists of all and only true statements whose truth can be determined referentially, without going beyong G and e(G).[3] By contrast true statements some of whose subject terms occur nonreferentially belong to the much more comprehensive range r(T), which consists of all and only true statements (i.e. everything which is the case). A major thesis of noneism can be restated thus: r(T) properly includes r(G), i.e. not all true statements involve subject terms occurring referentially. The class r(T)-r(G) is the class of true statements whose subject term occurs nonreferentially. As always there are two important, separable but interrelated, classes of cases, intensional statements and inexistential statements. Where A is inexistential one of A's subject terms is about what does not exist; and its semantical assessment makes appeal to elements of d(T)-d(G), i.e. to nonentities. Where A is intensional its assessment involves appeal to worlds other than G or T. For example, where Φ is a simple intensional connective, ΦB holds in T in virtue of the fact that B holds in some other worlds different from T but appropriately related to T. The relation involved is the semantical analogue of the "pointing" feature of intentionality stressed by phenomenologists (bracketing too can be seen as a case of world transfer).

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[1] Totalities are here represented by classes, in accordance with the set-theoretically biassed semantical framework adopted. In a different framework totalities would be represented, more accurately, as wholes, as mereological sums of the statements in them, i.e. $\underset{\sim}{r}(a)$ = sum{B: B η a}.

[2] Or rather that subset of e(a) that is appropriately transparent.

[3] It tends to be taken for granted in the text that e(G) is the world of entities, the liberal empiricist's thing world, and that Carnap's thing statements, e.g. "Scott is heavy", hold in G. But there are other ways of construing G and e(G), e.g. in terms of "stricter" forms of empiricism, such as operationalism or phenomenalism. And there is a certain point in stricter forms such as operationalism; for statements such as "This desk is brown" entail results about what would happen, whereas a really pure empirical basis would only report upon what does happen in certain operations and nothing much more. Thus 'is red' in contrast to, e.g., 'coincides with mark m' is, so to say, operationally-intensional, and can be analysed semantically in terms of worlds (thing worlds) other than the operational base world OG. In short, the worlds game that is played in the text is played over again (cf. the examples of SMM).

In other words, T, in contrast to G, is not on its own sufficient for the recursive determination of the truth of all the statements in it. In order to determine what holds in T then, it is necessary to examine worlds (represented by sets of statements) beyond T, to look beyond the actual (beyond what exists and beyond what is the case). What the statements of G are about are referents, which can have only referential properties, that is properties whose truth is determined just by reference and accordingly whose truth can be assessed just in G. The subjects of statements true in G cannot have intensional properties, such as being perceived or thought about, and they must all exist. G, like classical logic, consists of extensional statements about existing items. In contrast, the items statements of T are about include many which do not exist, and even those which do exist are not just referents but typically have intensional properties as well as extensional ones. The items of T are much closer to the ordinary concept of a thing than are the referents of G. To deny that T = G is, then, to reject the typical empiricist and extensionalist theses that all truths (worth stating) can be stated in G, that the only "genuine" properties are referential ones which belong to a referent, and the proper concept of an object is that of a referent.

So far no clear separation has been made between the factual model (or absolute framework), where what holds in T just is what is in fact true and all other worlds are governed by this requirement, and other models where T is relativised to each given model and gives the set of truths of that model. It clarifies matters to look back at the simple one world semantics given for sentential logic S. Among the models (or lines of a truth-table) for S, only one (or some if there are variables to take into account) gave assignments corresponding to the facts. For example, some would bring out 'Pegasus exists' as true, others would bring it out as false; all but those that correctly brought it out as false would be excluded as candidates for the factual modal; and so for every other elementary statement in the language, leaving (in a languate of constant statements) just one range.

For the semantical theories of formal languages while it is most important to consider all models, e.g. in assessing validity, it is quite unnecessary to specify or to make any use of the factual model; for it has no role to play in the determination of such central semantical notions as validity and satisfiability. On the other hand, for the semantics of natural language, where the important semantical notions are different, and include such absolute (i.e. non-model-relative) notions as truth, reference and meaning, specification of this (or a) factual model is crucial, while determination of the full class of models (of a given type) is of quite limited interest. In the sequel, both sorts of interests will matter. Where it is important to distinguish a factual model, double underlining of its key elements will be used. Thus in particular, T is the factual (actual) world, the actual world of factual model, and e(T) is the domain of entities, i.e. comprises exactly what does exist. The preceding discussion of the differences between T and G was, strictly, a discussion of the contrast between T and G, though the points made apply also to worlds T and G of other models.

A model, which is a system of worlds, that is a structure of worlds with certain properties standing in certain relations, can be represented set-theoretically as a relational structure, as an ordered set including all distinctive elements, or all those relevant for the purposes at hand. For example, a model M for neutral quantified S5 modal logic S5Q may consist of the relational structure $M = \langle T, K, D, I \rangle$ where K is a set of possible worlds, the factual world T belongs to K, D is a nonnull domain, the one domain, the same for each world, and I is an interpretation function on initial wff and worlds of K. But M may be varied in a number of ways without altering validity, e.g. T may be removed, or a relation R on worlds (important for analysis of weaker modal logics than S5) added, or D replaced by a function d, or I replaced by η, etc. It is often convenient, especially in application, of the semantics for technical purposes, e.g. for decidability arguments, in recovering matrices from the semantics, to isolate from within a model a model structure, that part of the model without the interpretation function or holding relation. Then an interpretation I is defined on a model structure, the interpretation characteristically being specified only for initial wff, and then being extended by inductive rules to all wff. Most of these points will now be illustrated in semantics for quantified modal logics.

8. Worlds semantics: quantified modal logics as working examples. Rather than the system S5Q, which correctly captures (so it is argued in EI) the logic of logical modalities such as logical necessity and logical possibility in combination with distributive neutral quantifiers, the system S2 that Lewis favoured, with an orthodox quantificational structure (a neutral version of that of Barcan 46), will be taken as basic, and semantics for other systems, such as S5Q, derived therefrom. The reasons include these: firstly, not all modalities are logical, and S2 illustrates well how other modalities may be semantically accounted for (e.g. all those of von Wright 51); secondly as a system, not for logical modality, but for entailment, which was what Lewis sought, S2Q is considerably superior to S5Q; thirdly, the neater semantics for S5Q, with only normal worlds and no interworld relation, do not illustrate nearly as well as those for S2Q the scope for enlargement of the semantical method to multiply intensional functors (such as, e.g, those of belief); and, fourthly, from the semantics for S2Q various semantics for S5Q are readily obtained, but the converse is not the case.

It is advantageous for later developments - with other one-place intensional functors and with entailment and implication correctives - to consider two different formulations of S2Q, a modal formulation S2QB (after Barcan's $S2^1$) and a strict implicational formulation S2QI.

The formation rules for these systems simply add to rules for Q, formulated without function parameters, rules - one each - for the intensional connectives $\Diamond$ (logical possibility) and $⥽$ (strict implication) respectively, namely the rules: Where A, B are wff then so are $\Diamond A$ and $(A ⥽ B)$. For comparison the respective primitive improper symbols and defined symbols of the systems are as follows:

	S2QB	S2QI
Primitives:	~ & ◇ U	~ & ⥽ U
Definitions:	A ⥽ B $=_{Df}$ ~◇(A & ~B) □A $=_{Df}$ ~◇~A	□A $=_{Df}$ ~A ⥽ A ◇A $=_{Df}$ ~□~A

Definitions common to both systems:

A ∨ B $=_{Df}$ ~(~A & ~B); A ⊃ B $=_{Df}$ ~A ∨ B; A ≡ B $=_{Df}$ (A ⊃ B) & (B ⊃ A);
A ⥽⥼ B $=_{Df}$ (A ⥽ B) & (B ⥽ A); (x)A $=_{Df}$ (Ux)A; (Px)A $=_{Df}$ ~(x)~A.

Postulates of S2QB

1. Sentential schemes (after Lewis; cf. Feys 65): A & B ⥽ A, A & B ⥽ B & A, (A & B) & C ⥽ A & (B & C), A ⥽ A & A, (A ⥽ B) & (B ⥽ C) ⥽. A ⥽ C, A ⥽ ◇A, ◇(A & B) ⥽ ◇A.[1]

2. Quantificational schemes (after Barcan): (x)A ⥽ A(t/x), (x)(A ⥽ B) ⥽. (x)A ⥽ (x)B, A ⥽ (x)A, where x is not free in A, ◇(Px)A ⥽ (Px)◇A.

3. Detachment rules: A, A ⥽ B ⇾ B; A, B ⇾ A & B; A ⥽⥼ B, D(a) ⇾ D(B); A ⇾ (x)A.

Postulates of S2QI

1. Sentential schemes: A ⥽ A, (A ⥽ B) & (B ⥽ C) ⥽. A ⥽ C, A & B ⥽ A, A & B ⥽ B, (A ⥽ B) & (A ⥽ C) ⥽. A ⥽ B & C, A & (B ∨ C) ⥽ (A & B) ∨ C, ~~A ⥽ A, A ⥽ ~B ⥽. B ⥽ ~A, A → ~A ⥽. ~A, A & B ⥽ C ⥽. A & ~C ⥽ ~B.

2. Quantificational schemes: (x)A ⥽ A(t/x), (x)(A ⥽ B) ⥽. A ⥽ (x)B, with x not free in A, (x)(A ∨ B) ⥽. A ∨ (x)B, with x not free in A.

3. Detachment rules: A, A ⥽ B ⇾ B; A, B ⇾ A & B; A ⥽ B, C ⥽ D ⇾ B ⥽ C ⥽. A ⥽ D; A ⇾ (x)A.

The sentential schemes of S2QI - which are those of relevant system DK of UL, together with Antilogism, A & B ⥽ C ⥽. A & ~C ⥽ ~B - contain redundancies, such as the distribution principle A & (B ∨ C) ⥽. (A & B) ∨ C, and could with minor adjustment be further reduced.

Equivalence Theorem: S2QB and S2QI are equivalent systems: i.e. if A is a theorem of S2QB then its definitional translation (into S2QI) is a theorem of S2QI, and conversely if A is a theorem of S2QI then its translation is a theorem of S2QB. (Proof is as in Routley 79b.)

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[1] Bracketing conventions are standard; see e.g. RLR. Deleting the last two schemes gives the axioms of S1°. Then the addition of A ⥽ ◇A yields S1 (or, added to S2°, S2), while ◇(A & B) ⥽ ◇A yields S2° (or, added to S1, S2).

In view of the equivalence theorem the semantics for both systems can be developed at once, under the head of S2Q: only the interpretation rules for $\Diamond$ and $⥽$ differ.

An S2Q model structure (m.s.) M is a structure $M = \langle T, K, N, R, D \rangle$, where K is a set of possible worlds, N, consisting of the modally normal worlds, is a subset of K, T, the factual world, is a member of N, R is a reflexive (accessibility) relation on K, and D is a non-null domain of items or objects. A modally normal world will turn out to be one where some recessitated wff, i.e. wff of the form $\Box C$, holds. It will follow, in virtue of the paradoxical character of S2Q (i.e. because $\Box C ⥽. A ⥽ B$) that every theorem of S2Q holds in modally normal worlds, i.e. such worlds are theorem regular, whereas in nonnormal worlds theorems may fail to hold, indeed all necessitated theorems will fail. Nonnormal worlds are a step - a very short and halting step-in the direction of incomplete and inconsistent worlds.

A S2Q model adds to a S2Q (m.s.) an interpretation or valuation function I (i.e. the model is a structure $\langle T, K, N, R, D, I \rangle$) which supplies assignments as follows: each subject term t is assigned an element I(t) of D; each n-place predicate parameter f is assigned, at each world a of K, a n-place (perhaps extensional) relation on K, i.e. extensionally a subset of K^n; and each sentential parameter is assigned, at each $a \in K$, just one of truth values in $II = \{1, 0\}$. Valuation I is then extended to all wff of S2Q as follows, for every $a \in K$: where f is a n-place predicate and $t_1, \ldots, t_n$ are n subject terms.

$I(f(t_1, \ldots, t_n), a) = 1$ iff $\langle I(t_1), \ldots, I(t_n) \rangle \in I(f, a)$;[1]

$I(A \& B, a) = 1$ iff $I(A, a) = 1 = I(B, a)$;

$I({\sim}A, a) = 1$ iff $I(A, a) \neq 1$;

[for S2QB] $I(\Diamond B, a) = 1$ iff for some c in K such that Rac, $I(B, c) = 1$, or else $a \notin N$, i.e. $\Diamond B$ holds at a iff either, for some world affecting (possibility assignments in) a, B holds at a, or a is not modally normal, i.e. no necessitated wff holds in a so every possibilitated wff (wff of the form $\Diamond D$) holds in a.

[for S2QI] $I(A ⥽ B, a) = 1$ iff $a \in N$ and for every b in K such that Rab and $I(A, b) = 1$ then $I(B, b) = 1$, i.e. $A ⥽ B$ holds at a iff a is normal (i.e. does not exclude wff of the form $A ⥽ B$, i.e. $\Box(A \supset B)$) and no world b affecting a provides a counterexample to $A ⥽ B$, i.e. a situation such that A holds at b but B does not.

$I((x)A, a) = 1$ iff $I'(A, a) = 1$ for every x-variant I' of I, where I' is an x-variant of I iff I' differs from I at most in assignments to x, i.e. roughly, (x)A(x) holds at a iff A(x) holds at a for every value of x.

Main semantical notions used in the investigation of S2Q can now be defined. These notions may be similarly defined for any first-order intensional logic. A wff A is true in M just in case $I(A, T) = 1$, and false in M otherwise. A is S2Q-valid iff A is true in all S2Q-models, and invalid otherwise. A set S of wff is S2Q simultaneously satisfiable iff for some S2Q-model M, every wff A is S is true in M.

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[1] The rule can be alternatively stated in attribute theory, using i(nstantiation) in place of $\in$. There is, that is, nothing uneliminably set-theoretical about the semantics.

Along with these objectual semantics, a truth-valued (or enlarged substitutional) semantics[1] is given, partly because it can be supplied at no extra cost, and partly in preparation for the semantical treatment of second-order logics (in §18). Truth-valued semantics for S2Q, which in effect always select D as the domain of terms of S2Q and so can delete D, are even simpler. An S2Q TV m.s. is simply a S2 m.s., i.e. a structure <T, K, N, R>. A TV valuation in such an m.s. is a function which assigns to each atomic wff at each a of K an element of II. The extension of I for wff compounded by connectives is as before, but the extension to quantified wff becomes:

> $I((x)A, a) = 1$ iff $I(A(t), a) = 1$ for every term t. TV truth, validity, and so on, are defined, in terms of TV valuations, as above for truth, etc.

Proving the adequacy of the semantics given for S2Q, i.e. that theoremhood and validity coincide, takes some trouble, at least the completeness proof does. While the soundness proof will be sketched, only the canonical modelling for the completeness argument and notions required for stating and outlining the strong completeness result are furnished (further details, including proofs of lemmas appealed to, may again be found in Routley 79b).

Soundness Theorem: Every theorem of S2Q is S2Q-valid, and also S2Q-TV-valid.

Proof is straightforward case by case verification, showing that the axioms are valid and that the rules preserve validity. Some strategic examples illustrate the details in the case of S2QI.

ad instantiation. Suppose $I((x)A(x) ⥽ A(t/x), T) \neq 1$ for some S2Q model. Then for some a such that RTa, $I((x)A(x), a) = 1 \neq I(A(t/x), a)$. Hence $I^x(A(x), a) = 1$ for every x-variant I^x of I, and so $I^t(A(x), a) = 1$, contradicting $I(A(t/x), a) \neq 1$.

ad distribution. Suppose, on the contrary, that for some a such that RTa, $I(\overline{(x)}(A ⥽ B(x)), a) = 1$ but $I(A ⥽ (x)B(x), a) \neq 1$, where x is not free in A. Then for some b such that Rab, $I(A, b) = 1$ and $I^x(B(x), b) \neq 1$ for some x-variant I^x of I. But $I^x(A ⥽ B(x), a) = 1$ always; so whenever Rab and $I^x(A, b) = 1$, that is, $I(A, b) = 1$, as x is not free in A, $I^x(B(x), b) = 1$, contradicting $I^x(B(x), b) \neq 1$. Details of the semantical verification reveal why this principle is a watershed one between rigid semantics, with a single domain D of objects the same for each world, and alternative variable-domain semantics.

ad affixing. Suppose, for some model M, $I(B ⥽ C ⥽. A ⥽ D, T) \neq 1$. Then for some a such that TRa, $I(B ⥽ C, a) = 1 \neq I(A ⥽ D, a)$, and so $a \in N$. Hence for some b, Rab, $I(A, b) = 1$ and $I(D, b) \neq 1$, and so also either $I(B, b) \neq 1$ or $I(C, b) = 1$. Now consider a new model M' which differs from M just in taking world a as base in place of T: this is permissible since $a \in N$. There are two cases to examine according as $I(B, b) \neq 1$ or $I(C, b) = 1$. Suppose $I(B, b) \neq 1$. Then as $I(A, b) = 1$, Rab and $a \in N$, $I(A ⥽ B, a) \neq 1$, contradicting the validity of $A ⥽ B$. So $I(C, b) = 1$. But then as $I(D, b) \neq 1$, $I(C ⥽ D, a) \neq 1$, contradicting the validity of $C ⥽ D$.

Completeness is most readily established through design of linguistically-characterised canonical models which reject given nontheorems, or sets of nontheorems (the methods are explained in detail in RLR, chapter 3). Canonical S2Q-models are characterised in terms of a class of straight S2Q-theories, a theory being represented as a class of wff satisfying specified conditions. Since the same notions feature in completeness proofs for a range of quantified implication systems LQ (e.g. for entailment systems), the preliminaries are stated more generally than required simply for S2Q. The definitions are intended to apply both to LQ and to linguistic extensions of LQ - also designated by LQ - obtained by adding further (at most denumerably many more) subject variables or constants to LQ (and accordingly inflating the supply of wff and logical axioms).

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[1] For a survey of such semantics, see Leblanc 76.

An *LQ-theory* d is any set of wff of LQ which is closed under adjunction and provable LQ-implication, i.e. for any wff A, B, if $A \in d$ and $B \in d$ then $A \& B \in d$, and if $A \in d$ and $\vdash_{LQ} A \strictif B$ then $B \in d$. An LQ-theory d is *regular* iff all theorems of LQ are in d; *prime* ($\vee$-complete) iff whenever $A \vee B \in d$ either $A \in d$ or $B \in d$; *rich* (U-complete) iff, whenever $A(t/x) \in d$ for every subject term t of LQ, $(x)A \in d$; *saturated* (P-complete) iff, whenever $(Px)A \in d$, $A(t/x) \in d$ for some term t of LQ. An LQ-theory is *quantifier-complete* iff both rich and saturated; *straight* iff prime and quantifier-complete; and *adequate* iff straight and regular. A theory is *non-degenerate* (n.d.) iff neither null nor universal (i.e. contains every wff). For systems with a classical negation, such as S2Q, the canonical model is built out of n.d. straight theories.

Let $\bar{K}_{LQ}$ be the class of LQ-theories, and K_{LQ} the class of n.d. straight theories. For $a, b \in \bar{K}_{LQ}$, $a \in \bar{N}_{LQ}$ iff a contains some wff of the form $B \strictif C$; $\bar{R}_{LQ}ab$ iff whenever $p \vee \bar{p} \strictif A \in a$, $A \in b$, i.e., in the case of all the systems to be considered, iff whenever $\Box A \in a$, $A \in b$ for every wff A; $\bar{O}_{LQ}a$ iff a is regular. $\bar{T}_{LQ}$ is the set of theorems of LQ, i.e. $\bar{T}_{LQ} = LQ$. The unbarred relations R_{LQ}, N_{LQ} and O_{LQ} are the restrictions to n.d. straight LQ-theories of the barred relations, e.g. R_{LQ} is the restriction of $\bar{R}_{LQ}$. Since for the modal systems LQ to be studied in this book $\vdash_{LQ} B \strictif C .\strictif. A \strictif A$, and so $\vdash_{LQ} B \strictif C \strictif. Th$ for every theorem Th, it follows that $a \in \bar{N}_{LQ}$ iff $\bar{O}_{LQ}a$ for every $a \in \bar{K}_{LQ}$. Thus $\bar{T}_{LQ} \in \bar{N}_{LQ}$.

Where T_{LQ} is any adequate LQ-theory, the *canonical model* LQ m.s. *on* T_{LQ} is the structure $M_c = \langle T_{LQ}, K_{LQ}, N_{LQ}, R_{LQ}, D_{LQ}\rangle$, where D_{LQ} is the class of terms of LQ. D_{LQ} is denumerable. That completes details of the canonical model. To state the strong completeness theorem for S2Q one further definition is needed. Where S and T are sets of wff of LQ, T is *LQ-derivable from* S, written $S \vdash_{LQ} T$, iff for some $A_1,\ldots,A_m$ in S and $B_1,\ldots,B_n$ in T, $\vdash_{LQ} A_1 \&\ldots\& A_m \rightarrow. B_1 \vee\ldots\vee B_n$. A basic case is where A is a nontheorem of S2Q; then A is not S2Q-derivable from the theory S2Q.

Strong Completeness Theorem for S2Q. Where U is a non-null set which is not S2Q-derivable from set S which contains an implicational wff, there is a [canonical] denumerable S2Q-model under which every member of S is true and every member of U false.

Proof. By a lemma there is an adequate S2Q'-theory T_{S2Q}, which includes S but excludes U. Form the canonical S2Q' m.s. M_c which includes S but excludes U. Form the canonical S2Q' m.s. M_c on $T_{S2Q'}$. It is denumerable. Define a canonical interpretation I in M_c as follows:

$I(p, a) = 1$ iff $p \in a$, for every sentential parameter p;
$I(t, a) = t$, for every subject term t of S2Q';
$I(f, a) = \hat{t}_1\ldots\hat{t}_n(f(t_1,\ldots,t_n) \in a)$ for every n-place predicate parameter f,
or alternatively $I(f, a) = \lambda t_1\ldots t_n\ (f(t_1,\ldots,t_n) \in a)$ for every f.

Since each term belongs to $D_{S2Q'}$, I is an interpretation in M_c.

It suffices to show

(α) $I(D, a) = 1$ iff $D \in a$, for every $a \in K_{S2Q'}$ and every wff D of S2Q', and

(β) M_c is an S2Q m.s. with base $T_{S2Q'}$.

For then the theorem follows. Firstly, for $A \in S$, $A \in T_{S2Q'}$ and so, by (α), $I(A, T_{S2Q'}) = 1$, i.e. A is true in the canonical model. Secondly, for $B \in U$, $B \notin T_{S2Q'}$, and so by (α) $I(B, T_{S2Q'}) = 0$, i.e. the canonical model falsifies B.

ad (β). It remains only to show $R_{S2Q'}$ is reflexive.

Suppose then for $a \in K_{S2Q'}$, $\Box A \in a$. Then, as $\vdash_{S2Q'} \Box A ⥽ A$, $A \in a$ by closure properties. (Note that $\Box A ⥽ A$ is implicationally equivalent to the reductio principle $A ⥽ \bar{A} ⥽.\ \bar{A}$.)

ad (α). Proof is by induction. Since

$$\begin{aligned} I(f(t_1,\dots,t_n), a) = 1 \quad &\text{iff} \quad \langle I(t_1),\dots,I(t_n)\rangle \in I(f, a)\\ &\text{iff} \quad t_1,\dots,t_n \in \hat{t}_1\dots\hat{t}_n(f(t_1,\dots,t_n) \in a)\\ &\text{iff} \quad f(t_1,\dots,t_n) \in a \qquad , \end{aligned}$$

the induction basis is established. The induction step for connective & is straightforward (and as in RLR).

ad ~. The result is straightforward once it is shown that $\sim A \in a$ iff $A \notin a$. Suppose firstly $\sim A \in a$ and $A \in a$. Then $\sim A \& A \in a$. But $\vdash \sim A \& A \rightarrow B$, so $B \in a$ for arbitrary B contradicting the non-degeneracy of a. Suppose, for the converse, $A \notin a$ and $\sim A \notin a$. Since a is non-null, some wff $D \in a$. Hence as $\vdash D \rightarrow.\ A \vee \sim A$, $A \vee \sim A \in a$, whence as a is prime $A \in a$ or $\sim A \in a$, which is impossible on the hypotheses.

ad →. D is of the form $(B ⥽ C)$. If $B ⥽ C \in a$ then $I(B ⥽ C, a) = 1$ in virtue of the definition of $R_{S2Q'}$ and the induction hypothesis. For the converse suppose $B ⥽ C \notin a$. By a lemma (which requires much work) there is a b in $K_{S2Q'}$ such that $B \in b$, $C \notin b$ and for every wff A if $\Box A \in a$ then $A \in b$. Thus $R_{S2Q'}ab$ holds. So applying the induction hypothesis, $R_{S2Q'}ab$ and $I(B, b) = 1$ and $I(C, b) \neq 1$, that is $I(B ⥽ C, a) \neq 1$, as required.

ad U. For every $a \in K_{S2Q'}$,

$$\begin{aligned} I((Ux)A, a) = 1 \quad &\text{iff} \quad I^x(A, a) = 1 \text{ for every } x\text{-variant } I^x \text{ of } I\\ &\text{iff} \quad I(A(t/x), a) = 1 \text{ for every } I(t) \in D_{S2Q'}\\ &\text{iff} \quad A(t/x) \in a \text{ for every term } t \text{ of S2Q', by applying the induction hypothesis and the equation } I(t) = t,\\ &\text{iff} \quad (Ux)A \in a, \text{ since } a \text{ is rich and closed under S2Q' implication.} \end{aligned}$$

For the truth-valued semantics the matter is still simpler. For $a \in K_{S2Q'}$,

$$\begin{aligned} I((x)A, a) = 1 \quad & \text{iff} \quad I(A(t/x, a) = 1 \text{ for every subject term } t; \\ & \text{iff} \quad A(t/x) \in a \text{ for every } t, \\ & \text{iff} \quad (x)A \in a. \end{aligned}$$

For if $A(t/x) \in a$ for every t then, by richness, $(x)A \in a$; and the converse follows by instantiation and S2Q'-closure.

Corollaries

1 (Completeness). Every valid wff of S2Q is a theorem.

2 (TV Completeness). Every TV valid wff of S2Q is a theorem of S2Q.

3 Every S2Q-theory is simultaneously satisfiable in a denumerable model, and thus has a model.

4 (Skolem-Lowenheim). Every simultaneously satisfiable class of wff is simultaneously satisfiable in a denumerable model.

5 (Compactness). If S is a set of wff of S2Q such that every finite subset of S has an S2Q-model then S has an S2Q-model.

Proof 1. Suppose A is a non-theorem of Q. Set U = {A} and S = S2Q and apply the theorem.

3. Let S be an S2Q-theory and let U = {D} where D is a wff, guaranteed by non-degeneracy, not in S, and hence not S2Q-derivable from S. Thus by the strong completeness theorem, S is simultaneously satisfiable in a denumerable model.

4. Apply 3.

5. Suppose S is a set of wff such that every finite subset of S has a model. Then every finite subset of S is consistent and hence absolutely consistent. Hence S is absolutely consistent, since a given arbitrary wff is only S2Q-derivable from S only if it is derivable from a finite subset of S; that is, some wff D is not derivable from S. But then by a lemma there is an S2Q-theory S' including S but not containing D. Hence by 3, S' and so S has an S2Q-model.

Now simple variations on the arguments will supply constant domain semantics with nice corollaries for many other quantified modal logics, e.g. semantics for S3Q result upon requiring that relation R be transitive; for TQ that N = K i.e. all worlds are normal; for S4Q that R be transitive and N = K; for S5Q in addition to S4Q requirements that R be symmetrical (whence R is an equivalance relation and can indeed be eliminated from the modelling, as in Carnap's and Kripke's semantics for orthodox S5Q).

Modal logics leave as with a serious dilemma owing to their conflation of modality and implication. For while the implicational theory forces us (or should force us, if our sensibility to implicational principles has not been entirely warped) towards systems S2 or S3, the modal theory forces us towards S4 or S5. (The reasons are presented in RLR, chapter 1). Since our present interest is primarily modality, we shall now swing in the S5 direction (especially since it is argued in EI, p.140 ff. and RLR that S5 is the correct system for logical modalities, i.e. where $\Box$ reads 'it is logically necessary that' and $\Diamond$ 'it is logically possible that'). The following axiom which guarantees an S5 modal structure are accordingly grafted onto S2Q, yielding system S5Q for which semantics have already been indicated, namely $\Diamond A \mathrel{-\!\!3} \Box\Diamond A$. As to how this scheme yields S3 and S4 postulates, see Feys (65, p.115).

Adoption of S5Q opens the way to certain objections, often reckoned to be very telling, that have been directed against logics including an S5 modal structure (and sometimes, erroneously, against any modal logic). In particular it has been objected, first, that an S5 structure guarantees the derivability of the very dubious Barcan wff, namely $\Diamond(\exists x)A \supset (\exists x)\Diamond A$ and $(x)\Box A \supset \Box(x)A$ (Barcan formulae) and their converses $(\exists x)\Diamond A \supset \Diamond(\exists x)A$ and $\Box(x)A \supset (x)\Box A$ (Barcan converses), and that any weaker modal structure requires these formulae for logical reasons; second, that a quantified modal logic with identity leads inevitably to the formulae $\Box(x = y) \equiv. x = y$ and thence to modal paradoxes; and, thirdly, that any normal modal logic excludes, by its rule of necessitation, contingent assumptions, such as that something exists, from the logic.

None of these objections work against the logic presented. Firstly, the Barcan formulae are not theorems, indeed are not even wff until an existence predicate is introduced (as in the next subsection), only the quite unobjectionable neutral analogues of Barcan wff are theorems. The standard objections to Barcan wff (both formulae and their converses) depend on existential construal of the quantifiers and fail when the quantifiers are construed neutrally (see Slog, p.546). Secondly, as already explained (§11, p.100), when identity is properly introduced, the modal paradox arguments fail, and the "validity" of the wff $\Box(x = y) \equiv. x = y$ depends upon confusing strict and extensional identity. Thirdly, the assertion of contingent truths in the logics is not excluded; for necessitation is not a rule of the logic, but only a derived rule which does not hold for extensions of the logic by merely contingent postulates. That is, contingent truths can be consistently added to the logic, without being necessitated.[1]

9. Reworking the extensions of quantificational logic in the modal framework. Just as quantificational logic was enriched by many adjuncts, existence and possibility predicates, predicate negation, choice descriptors, so, in the quest for an adequate logic ... each of the successors of quantificational theory can be enriched, beginning with quantified modal logics. But we can be brief about some of these enrichments, since in some cases the matters have been treated elsewhere and in other cases the same issues will arise again at the next stage (§18 or following). The order of treatment is roughly that of increasing problematicness.

a. Existence and Barcan wff. As in Q, so in LQ an existence predicate E can be introduced, or some predicate constant assigned to fulfil its role. As before LQ is some quantified intensional or modal logic (usually with a constant, i.e. world-invariant, domain of objects). In the basic system, LQ with E, E satisfies no further conditions. Even in such a system a good deal can be accomplished, as development of the system $S5R^*$ of EI reveals (p.114 ff.) In particular, it can be straightforwardly demonstrated that the Barcan wff and their converses fail, and should fail (EI, p.117); and convincing restrictions on the truth of Barcan wff can be deduced from the theory.

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[1] An example drawn from the next subsection, from system LQE, is the contingent truth (Px)xE. And in fact were $\Box$(Px)xE to follow, by necessitation, the inconsistency of LQE would result by Meinong's theorem according to which nothing necessarily exists.

A somewhat more interesting system with existence S5QE has these axioms on existence:

E1. $(Px)xE$
E2. $(Px)\Box{\sim}xE$
E3. ${\sim}\Box(Px)xE$

E1 is true because something does in fact exist; E2 is true because some things, impossibilia, necessarily do not exist; while E3 is true because, more controversially, nothing exists of logical necessity. It follows, incidentally, since it is provably false that $\Box(\forall x)xE \supset (\forall x)\Box xE$ (and similarly for its strict analogue), that the converse Barcan formulae are demonstrably false.

A semantics for S5QE is already given in Slog (p.549 ff.); it suffices to sketch the details. Even when the objects of different worlds are appropriately invariant, what exists will vary from world to world. Thus to domain 1) is added a functions, e (giving existents at each world), subject to the following modelling requirements: e(T) is nonnull, for some a such that TRa, e(a) is null, and for every b such that TRb, D−e(b) is nonnull. The evaluations rule for E is as follows:

$I(tE, c) = 1$ iff $I(t) \in e(c)$.

Adequacy of the semantics is established as in Slog (p.550), which also studies significance elaborations of quantified modal logics with existence, and in particular systems which enable the proper distinction of inconsistent subjects from absurd subjects, such as 'the wheels of happiness' and 'Meinong's round idea'.

b. *Possibility and other properties*. What has been done with existence can be replicated or varied for other ontic properties, for instance for possibility.

c. *Predicate negation and internal negation*. The logical theory of predicate negation 1.17(4) is straightforwardly extended to intensional settings. In modal logics like S5Q the axiom is $\Box DN^n$, i.e. the necessitation of DN^n, in entailment logics the axiom is $\underset{\sim}{t}{\sim}{\sim}h \Leftrightarrow \underset{\sim}{t}h$. The semantics is as before except that T is replaced by world variable a, e.g. $I(\underset{\sim}{t}{\sim}h, a) = 1$ or $= 0$ according as the model assigns subject to the restriction that $\underset{\sim}{I}(\underset{\sim}{t}{\sim}{\sim}h, a) = I(\underset{\sim}{t}h, a)$.

The semantics for internal rejection is obtained by adding to models an operation † on K which is involutory, i.e. $a^{\dagger\dagger} = a$ for a in K. The rule for evaluating internal negation − is simply $I(\bar{A}, a) = 1$ iff $I(A, a^{\dagger}) \neq 1$, for every a in K and every wff A. The role of internal negation is further considered in §23.

d. *Extensional identity*. Within the framework of quantified modal logic an interesting, if rudimentary, theory of extensional identity can be obtained, and the discussion of §11 (especially p.102 ff.) formally elaborated. A formal theory of extensional identity may be obtained in the following way (there are several equivalent approaches):– To any of the quantified modal logics considered is added (or singled out) a two-place predicate constant =, read 'is (extensionally) identical with' or 'is identical with (under the extensional determinate)', and subject to the expected formation rule: where u and v are subject terms (u = v) is a wff (cf. 1.17(6)). The basic postulates are (on a standard S5Q formulation):[1]

=1. $u = v$

=2. $u = v \supset. A(u) \supset A(v)$, where u and v are subject terms and A(v) results from A(u) by replacing an occurrence of u by v, this occurrence being neither within the scope of quantifiers (or descriptors) binding variables in u or v nor modalised, i.e. within the scope of a (primitive) modal connectives such as $\Diamond$, $\Box$, ⥽ (proviso III).

It follows, among other things (see EI, p.121) that = is a reflexive, symmetric and transitive relation, i.e. is an equivalence relation, satisfying qualified substitutivity conditions.

Strict identity is defined: $x \equiv y =_{Df} \Box(x = y)$. It can be shown that strict identity is characterised by the following schemes:-

≡1. $u \equiv u$

≡2. $u \equiv v \supset. A(u) \supset A(v)$, subject to proviso I (of 1.17(6)),[2]

i.e. the provision differs from proviso III in not excluding replacements in modal contexts. The scheme ≡2 is proved by an inductive argument (see EI, p.122). Conversely, if ≡ is introduced as a further primitive satisfying ≡1 and ≡2, it is readily proved that $x \equiv y$ ⥼⥽. $\Box(x = y)$.

It is evident, from a comparison of ≡1 and ≡2 with ≈1 and ≈2 (of 1.17(6)), that strict identity coincides in quantified modal settings with Leibnitz identity. However this feature simply reflects the fact that such modal logics contain no more highly intensional functors. A system which also included, for instance, such epistemic functors as 'x knows that' and 't believes that', would make the requisite distinction, Leibnitz identicals but not strict identicals being replaceable in epistemic contexts. (Further schemes resembling ≡2 but for epistemic identity relations are straightforwardly devised; then too the ways in which schemes for various identity determinates interconnect begin to emerge. How the schemes are unified is considered in §20.)

As important as what holds valid for identity is information as to what fails. Most important, $x = y \supset \Box(x = y)$ fails. It is not that the negation of its closure, namely $\sim(x, y)(x = y \supset \Box(x = y))$, is a theorem - though there are stronger consistent systems containing the latter as a theses (see EI, p.123) - but that the principle is rejected, as not valid, i.e. $\dashv x = y \supset \Box(x = y)$. Various means can be used to show that such undesirables are rejected, e.g. tableaux methods (as in EI), but modelling techniques are perhaps the best, and these emerge from that desideratum, semantics for the systems.

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[1] That is, where the formulation includes a rule of necessitation or requisite equivalent. Where it does not, as with the formulation of S5Q presented in 1.17(8), the necessitations of =2 and =3 are the postulates required, i.e.

$\Box(u = u)$ and

$u = v$ ⥽. $A(u) \supset A(v)$, subject to proviso III.

[2] The point of the previous note is again relevant. If necessitation is not given (in effectively primitive form), ≡2 is replaced by $u \equiv v$ ⥽. $A(u) \supset A(v)$, with proviso I.

Semantical models for system $LQ^=$, i.e. for LQ together with extensional identity, are the same as those for underlying system LQ. All that is new is a rule for evaluating identity wff at worlds, a rule rendering a little more explicit of what is already given, namely I(u = v, a) = 1 iff <I(u), I(v)> i I(=, a), so that postulates =1 and =2 can be verified. The rule is this:

$$I(u = v,\ a) = 1 \text{ iff } I(u) =_a I(v),$$

i.e. I(u) and I(v) are a-identical, where a-identity is coincidence on all properties which are evaluated just at a (i.e. as to extensional features), without going wff a, through an interworld relation, to other worlds. The relation a-identity is a generalisation of extensional identity, which is T-identity.[1] Since a T-identity, such as Venus $=_T$ Adonis, does not guarantee an a-identity for every world a assessible from T, e.g. for world b, so that ~(Venus $=_b$ Adonis), in suitable models I(Venus = Adonis ⊃. □(Venus = Adonis), T) ≠ 1, confirming the rejection that led into the semantical theory. To be sure there is a certain circularity about the evaluation rule for =, as there is with the rule for U in terms of every, and with the derived rule for ≡, I(a ≡ v, a) = 1 iff I(u) is the same as I(v), which removes world relativisation. The rules are by no means rendered worthless by such circularity.

Evidently u = u is valid, since I(u) coincides with itself at T on all properties, i.e. $I(u) =_T I(u)$. And =2 is valid, ultimately because only the evaluation of excluded modal connectives involves world transfer. Remaining details of proof of the adequacy of the semantics furnished is along the lines set out in Slog (p.532 ff.).

Pretty though the logic and semantics for = are they are not faultless (even for those happy with the notion of extensional identity and with worlds semantics, few enough of course). A serious shortcoming is that, as with the initial identity theory (of 1.17(6)), no formal provisions stop highly intensional functors from entering as primitive predicates open to substitution; so substitutions may result which violate extensional identity requirements. The implicit assumption that all primitive predicates are extensional is hardly satisfactory when it comes to natural language applications of the logic. Nor can it be realistically assumed that every intensional predicate, such as f, can be analysed into a form Φ(... g), where Φ is an intensional sentence connective and g is an extensional predicate, i.e. that all predicate intensionality can be pushed into sentence connectives. Prima facie ordinary predicates such as (... looks for) are not so compounded; and there are deeper reasons for the failure of this popular idea (see Slog, p.610 and p.624).[2] Certainly such an assumption breaks down given only the relatively poor resources of quantified modal logics, since more highly intensional predicates cannot be modally resolved. It remains important then to distinguish initial predicates which are extensional from those which are not; in short, in a further theory to introduce predicate ext, as in 1.17(b).[1]

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[1] There are other ways of obtaining a suitable rule for evaluating =. One is presented in EI, pp.135-36; another is to world-relativize subject assignments and to set I(u = v, a) = 1 iff I(u, a) = I(v, a), i.e., in effect, iff u at a is the same as v at a (cf. chapter 2, where the at operation is introduced).

[2] Naturally if a predicate resolves into an intensional sentence connective in combination with some predicate, as does 'is believed to be given', that is an excellent indicator of extensionality of the original predicate.

The fuller theory of extensional identity accordingly includes both = and ext. The postulates for = are necessitated versions of those already given, namely

=1. $\Box(u = u)$

=2B. $u = v \;\&\; ext_i f^n \rightarrow (\ldots u_{ith}\ldots)f^n \supset (\ldots v_{ith}\ldots)f^n$

=3. $\Box ext(=)$

and, where E is present,

=4. $\Box ext(E)$.

Now, furthermore, =2 follows subject to the correct provisions, namely proviso III. For there is no warrant for replacements within modal connectives, reflecting the fact that $\sim ext(\Box)$. A residual dissatisfaction remains, however, in that it is still not possible to define extensionality for connectives and functors of functors within the systemic framework. By moving to the second-order such problems can be removed.

To extend the semantics for LQ= to the fuller theory LQ = ext with extensionality, a semantical rule for ext_i suffices. The requisite rule, no longer trite in an intensional semantical framework, is:

> $I(ext_i f, a) = 1$ iff, for every given assignment to the other places of f^n than the ith, the evaluation of whether the predicate f^n holds of an item at a (i.e. the evaluation of the ith place) is restricted to a, i.e. does not go beyond a.

This "rule" accords with the account of extensionality adopted, that a predicate is extensional if its semantical assessment does not involve world-transfer to worlds other than worlds (of its class) where the evaluation is being made. The account is elaborated in Slog pp.610-11 where some of the reasons for adopting it are also explained. For the nontrite rule (as distinct from the trite rule: $I(ext_i f, a) = 1$ iff at a the ith place of f^a is extensional) to succeed, there is a real point in using the intensional (or functional) semantics presented rather than the set-theoretical which make it look as if all primitive products are extensional.

e. Reduction principles in quantified modal logic. Just as sentential modal systems such as S2 and S5 are distinguished by sentential principles, the correctness of which (for various interpretations and applications) has to be seriously considered, so there are distinctive (essentially) quantification principles which distinguish various quantified modal logics in the vicinity of S2Q and S5Q and intermediate systems, the correctness of which needs to be considered. For if such a principle is correct, then a logic which lacks it is incomplete - despite a semantical completeness argument of the sort furnished in the previous subsection.

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[1] But for most formal purposes it is thus far, simpler to avoid ext, and to use the split-up method.

Principles which can be quickly dismissed are those which directly reduce modalities to quantifiers, viz. a) $(x)A \mathrel{⥽} \Box A$ and b) $\Box A \mathrel{⥽} (x)A$. These principles are tempting perhaps because of their simplifying effects, because of the way they enable S5Q model postulates to be dispensed with while at the same time delivering welcome principles such as Meinong's theorem. But they do too much. For example b), though it is provable where x is not free in A, is quite unacceptable, as the following example shows:- Since impossible items necessarily do not exist, it is true that $(Px)\Box{\sim}xE$. But then it follows by b) that $(Ux){\sim}xE$, i.e. nothing exists![1]

Of particular interest are principles which reduce "problematic" modal expressions. The problematic modal expressions of quantified modal logics such as QS5E are expressions of the form: δA, where A is a predicate expression containing free variables and δ is a modal functor. Whereas the modal functors of other - non-problematic - modal expressions of S5QE have a fairly straightforward de dicto rendering, the modal functors of problematic modal expressions are sometimes, supposed to represent de re modalities (in one sense of this dubious medieval distinction); actually they also have a de dicto reading. At any rate there are more difficulties about how problematic expressions such as $\Box xf_0$ are to be construed than there are about non-problematic expressions or about expressions which don't contain modal functors such as xf_0. Thus it is an important question whether problematic modal expressions can be eliminated in favour of at least logically equivalent non-problematic expressions or in favour of sets of such expressions. Since all iterated modalities collapse in S5QE and since all variables can be bound there are only four main problematic modal schemes to consider: these can be typified using the sample predicate f by:

$$(x)\Box xf,\ (Px)\Diamond xf,\ (x)\Diamond xf,\ (Px)\Box xf$$

Now the first two can be eliminated using the provable equivalences

$$(x)\Box xf \mathrel{⥼⥽} \Box(x)xf \text{ and } (Px)\Diamond xf \mathrel{⥼⥽} \Diamond(Px)xf.$$

Can the last two be eliminated? Both von Wright and the Kneales claim that in the case of logical modalities (and classical quantifiers) they can. If they can be eliminated not only is S5QE defective under interpretation because it contains too many distinctions; also, according to von Wright, combination of modalities with quantification loses some of its interest.

The Kneales, who tentatively reach the conclusion 'that there is no need to admit the operation of quantifiers across modal signs' (62, p.618) begin by distinguishing two interpretations of $(\exists x)\Box xf$: neither interpretation is really satisfactory, and the two are not exhaustive (since, e.g., 'some or other' differs from 'a certain'). Under the first essentialistic, and inadequate, interpretation, as 'there is something which under any description is necessarily f', the statement is reckoned to be equivalent to $\Box(\forall x)xf$. The second interpretation of '$(\exists x)\Box xf$', as 'there is something which under some description is necessarily f', is more important. Then, the Kneales argue

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[1] Principle b) also leads to the principle of predication which is refuted below.

> ...$(\exists x)xf$ cannot express a true proposition unless there is something which among its permissible descriptions has one entailing the predicate xf. But this is as much as to say that the disputed formula is equivalent to $(\exists x)xf$. Therefore $(\exists x)\Box xf$ cannot on either interpretation represent a new kind of proposition.

The argument is invalid. The Kneales assert what is tantamount to: $(\exists x)\Box xf ⥽ (\exists x)xf$, which is correct. But this is not to say $(\exists x)xf \equiv (\exists x)\Box xf$ as they claim. They do not show how $(\exists x)xf \supset (\exists x)\Box xf$ follows; and it does not. It is not a theorem and not valid under the second intended interpretation. There are critical limitations on the ways an item may be correctly described.

Von Wright bases his elimination proposal on his principle of predication (advanced in 51, p.27), a principle which can be formulated neutrally, when significance conditions are omitted, as,

PP. $(Px)(\Diamond xf \supset \Box xf) \supset (Ux)(\Diamond xf \supset \Box xf)$

or, more revealingly, $(x)(\Box xf \vee \Box{\sim}xf) \vee (x)(\Diamond xf \,\&\, \Diamond{\sim}xf)$. Thus on the strength of this principle von Wright divides attributes into two classes: logical and descriptive. Then separate elimination schemes are suggested for problematic modal expressions according as the property specified is logical or descriptive, e.g. $(Px)\Box xf$ is eliminated using: if f is logical, $(Px)\Box xf \equiv (Px)xf$; if f is descriptive, $(Px)\Box xf \equiv \Lambda(\equiv \Box(Px)fx)$, i.e. is equivalent to the False. Von Wright does not propose (contrary to what Prior suggests; 62, p.211) a single unconditional elimination scheme such as is illustrated by the interchange principle

IP1. $(Px)\Box xf \equiv \Box(Px)xf$

However given a very plausible condition on logical properties IP1 does follow from von Wright's elimination schemes. Even so IP1 does not follow from PP (as construction of an appropriate semantic tableau discloses: for the tableau method see EI). Principle PP does not appear to provide a single elimination scheme. Any scheme it did furnish would be as unsatisfactory as the principle PP on which it is based. Principle PP, as would be expected of such a *some* to *all* implication, is not valid in S5QE; but that may only reflect a defect in the system. PP is also said to be in doubt (von Wright) or falsified by higher-order properties (Prior: see 62, p.212). It is certainly falsified by the theory of items (and by *any* satisfactory theory), in the case of the supervenient predicate E, and its negation. For it is true both that $(Px)\Box{\sim}xE$ and $(Px)\nabla T{\sim}xE$, i.e. for some x it is necessary that x does not exist and for some other x it is contingently true that x does not exist. For it follows $(Px)(\Box{\sim}xE \vee \Box xE)$ and $(Px)(\Diamond{\sim}xE \,\&\, \Diamond xE)$, contradicting PP.[1] Recourse to supervenient predicates is not however required; on the theory of items almost any characterising predicate which is sometimes contingently held yields counterexamples to PP. Consider, for instance, 'is round'; for some x, e.g. the round square, necessarily x is round, while for some x, e.g. a garden bed, it is contingent x is round. In fact, the PP principle and the proposed elimination schemes are implausible once a purely referential theory of the role and meaning of variables and constants is abandoned. Whether a property belongs necessarily to a subject which has it does not as a rule depend just on the sort of attribute; it also depends commonly on the description or mode of signifying the object, on what the object is. The Kneales drive this point home beautifully (62, p.616). Von Wright cites as typical logical properties arithmetical properties. But as Kneale say:

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[1] Negate the revealing form of PP and then push the negation down to initial wff: the result is $(Px)(\Box xf \vee \Box{\sim}xf) \,\&\, (Px)(\Diamond xf \,\&\, \Diamond{\sim}xf)$.

> Being less than 13 is an arithmetical attribute, and we may, if we like, say that it belongs necessarily to the number 12; but it is false that the number of apostles is necessarily less than 13, although the number of apostles is undoubtedly 12.

As soon as it is admitted that true ascriptions of modal properties to subjects is not merely referential, but depends on the meanings of the subjects, on their interpretation in worlds other than G, that classification of properties as logical or descriptive which rests on the principle of predication breaks down. Thus the dichotomy essential for von Wright's replacement of problematic modal expressions is destroyed. Furthermore even when f is an example of what von Wright would class as a descriptive property, e.g. a simple colour property, $(Px)\Box xf$ is not automatically false. The same mistaken assumptions are made in the principle of predication as are made in some of Quine's arguments concerning quantifying into modal frames (see 1.11).

The interchange principles, IP1 and its mate

IP2. $(x)\Diamond xf \equiv \Diamond(x)xf$

which would enable the elimination of problematic modal expressions, are considerably more difficult to assess. It suffices of course to confirm or falsify one of the principles, since $(x)\Diamond A \equiv \Diamond(x)A$ and $(Px)\Box A \equiv \Box(Px)A$ are interderivable. Neither principle is valid in S5QE. More generally, neither is valid in any system which interprets quantifiers in the usual extended truth-function way, e.g. the universal quantifier as like a conjunction or as an infinite conjunction. For instance, a two object model would reduce IP2 to the form $\Diamond p_1 \ \& \ \Diamond p_2 \equiv \Diamond(p_1 \ \& \ p_2)$, which is false (take p_1 as contingent and p_2 as $\sim p_1$). But such an appeal is not decisive; in particular, it does not show that IP1 and IP2 are not true for other quantifier determinates, which perhaps correspond better to a natural language quantifiers. Prior does argue independently however, that the interchange principles are false (62, pp.212-23). Prior argues that $(x)\Diamond A$ is sometimes true but $\Diamond(x)A$ is always false in the case where A is the wff $xf \ \& \ (Px)\sim xf$. It is indeed provable, e.g. in S2Q, that $\sim\Diamond(x)(xf \ \& \ (Px)\sim xf)$,[1] so $\Diamond(x)A$ is certainly false. But 'the assertion $(x)\Diamond A$, with everything it is possible that the thing should f when there is something that does not f, is for many f's, perfectly true' (p.213). Whether this is ever true depends crucially on the terms involved, what is admitted under 'everything'. In particular, to come directly to the point, if ξ terms are admitted in the expected fashion, Prior is simply wrong. For as $(\xi x\sim xf)f \rightarrow (x)xf$,[2] $(Px)(xf \rightarrow \sim(Px)\sim xf)$ by particularisation, whence $\sim(x)\Diamond(xf \ \& \ (Px)\sim xf)$ for every f. The question of the correctness of interchange principles thus leads to the vexed issue of descriptors in quantified intensional logics.

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[1] In outline a proof runs as follows: $(Px)\sim xf \vee \sim(Px)\sim xf$, by LEM; $(Px)\sim xf \vee (Px)\sim(Px)\sim xf$; $(Px)(\sim xf \vee \sim(Px)\sim xf)$, $\sim(x)(xf \ \& \ (Px)\sim xf)$. But each line can be covered by $\Box$, since $\Box(B \vee \sim B)$ and $C \rightarrow D \Rightarrow \Box C \rightarrow \Box D$; and $\Box\sim D \equiv \sim\Diamond D$.

[2] $\xi x\sim xf$ serves as an f universality indicator.

f. Choice operators and descriptors. Somewhat as the quantifiers U and P of Q can be extended in more than one way to modal enlargements of Q (e.g. as conforming to interchange principles or not), so choice operators and other descriptors can be combined in different, perhaps competing, ways with modality. The obvious, and a correct, way to introduce descriptor ξ into modal logics such as S2 and S2Q is (so it is argued in Slog, p.560 ff. and in PLO) to have it conform to the scheme

$\Box A\xi$. $A(t) \strictif A(\xi xA)$.

Call the zero-order formulation of S2 to which ξ is added subject to the scheme $\Box A\xi$, S2ξ. Quantifiers are definable in S2ξ as for SQξ. Then S2ξ contains S2Q, but it is not a conservative extension of it. For, in particular, the interchange principles are theorems of S2ξ. It is enough to prove $(Px)\Box A \strictiff \Box(Px)A$.

ad $(Px)\Box A \strictif \Box(Px)A$. Proof is as for S2Q: $A \strictif (Px)A$, $\Box A \strictif \Box(Px)A$, $(x)(\Box A \strictif \Box(Px)A)$, $(Px)\Box A \strictif \Box(Px)A$.

ad $\Box(Px)A \strictif (Px)\Box A$. By $A\xi$, $\Box A(\xi xA) \strictif \Box A(\xi x\Box A)$, whence the result by definition of P.

S2ξ corresponds not to S2Q but rather to the logic S2R which results from S2Q by addition of the interchange scheme $\Box(Px)A \strictif (Px)\Box A$.

While the deductive development of quantified modal epsilon systems is straightforward, and like that for corresponding relevant logics in PLO (p.176 ff.), the semantical theory takes a new turn. For in order to obtain a suitably objectual semantics - a desideratum for a theory of objects - within the scheme of things so far presented, the constant domain requirement has to be qualified. The reason is that the interpretation of ξxA may vary from world to world, e.g. it may select object 1 in world a and a different object, object 2, in world b. Nothing stops the choice made varying from world to world, and due allowance for varying choice has to be made to guarantee that $\Box A\xi$ holds generally. Thus an interpretation of ξxA at world a has to be given, i.e. $I(\xi xA, d)$ has to be defined, not just $I(\xi xA)$. Correspondingly then the interpretation of all subject terms has to be world relativised; with the result that I now assigns to each initial term t at each world d in K an element of D. Likewise the rule for evaluation of initial wff is amended to

$$I((t_1,\ldots,t_n)f, a) = 1 \text{ iff } \langle I(t_1, a),\ldots,I(t_n, a)\rangle \mathrel{i} I(f, a).$$

In short, models are LQ models, apart perhaps from the addition of a choice for notion, but an interpretation is modified in the two respects noted. A choice function c is defined on subsets of domain D as before, i.e. c is such that where D' is a nonnull subset of D, $c(D') \in D'$, and otherwise $c(D') = c(\Lambda) = c(D)$. Then the world relatived rule for interpreting $\xi xA(x)$ is simply

$$I(\xi xA(x), d) = c\,\{I(x) \in D\colon\ I(A(x), d) = 1\}.$$

That is $I(\xi xA(x), d)$, the interpretation of ξxA at d, is a chosen element of the domain which of which A holds at d. The adequacy of this objectual semantics can be established along the lines set out in PLO, p.190 ff. (or, more perfunctorily, in Slog, p.563 ff.).

World relativisation of subject terms can be avoided by various strategies, for example, by what is straightforward but quite artificial, truth-valued semantics for ξ wff (see PLO, p.187), or, less straightforwardly, by changing the conception of a domain to include objects such as ξ terms pick out across worlds (cf. space-time worms across times).

Despite the fact that a perfectly satisfactory logical and semantical theory for quantified modal logics with choice operators can be supplied (with a clean healthy-living objectual semantics), such systems and their adoption have encountered heavy criticism. The main objections lodged have already been examined in detail in Slog, p.561 ff. and PLO (p. 156 ff. and p.187 ff.) and found wanting.

10. Beyond the first-order modalised framework: initial steps. To obtain a more adequate logical theory where a beginning can be made on the questions as to whether such attributes as existence and identity can be characterised - as distinct from introduced as primitives - quantification logic has to be expanded. The orthodox expansion consists in moving up the order (really type) hierarchy. There is certainly good reason to enlarge the logical theory to (something like) second-order theory, where quantification over attributes is available, and the resultant ability to speak generally and particularly about attributes enables certain identity notions to be defined, and offers some prospect of being able to obtain similar definitions for existence, possibility, and so forth. Reformulated second-order logic has other major advantages too; in particular, while it enables much to be represented it does not really set the logic on the dangerous slopes of type theory in the way that third-order theory does. It has also disadvantages, notably in the impurity of its semantical theory (see Slog, p.576), and in the conceptual confusion usually embodied in its intended construal and reading (that higher order predicates logic is so confused is argued in Slog §7.12). For these reasons it is worth trying to keep some track of what calls for second-order theory and what can be formulated, or reformulated, in augmented neutral quantification logic. It will be found that much of what follows can be quantificationally expressed.[1]

§18. *The neutral reformulation of mathematics and logic, and second stage logic as basic example. The need for, and shape of, enlargements upon the second stage.*

There are two main steps in the neutral (i.e. nonreferential) reformulation of a mathematical or logical theory, which fully withdraws the theory from Reference Theory addiction. The steps are in every case simpler to apply if the theory has something approaching an exact logical formulation. They are:-

1. The existence, and quantificational fix. The quantifers of the theory are usually rewritten neutrally, and status predicates rewritten neutrally, e.g. 'exist' or 'is an entity' is replaced by 'is an object', existence theorems are replaced by particularity theorems, etc.

2. The identity fix. Sometimes an interpretational restriction to extensional predicates is sufficient, e.g. in neutralising applications of

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[1] An underlying thesis, that will get little exposure or defence in what follows, is that the theory of orders is unnecessary and undesirable and can and should be abandoned: see PD. The same applies to Russellian types and orders, and to levels of languages.

Zermelo-Frankel set theory. Otherwise the theory is taken to include only a strong identity inapplicable to ordinary examples, or else the theory is recast with an extensional identity.

For anyone who rightly wishes to remove, or explicitly acknowledge, consistency assumptions along with referential ones, there is a further major step:-

3. The consistency fix. The rule γ of Material Detachment (and perhaps other rules) are rewritten as theory-restricted admissible rules, and in case consistency of the theory cannot be satisfactorily established an overarching consistency proviso on the theory is included. If the proviso fails the theory's licence to operate is withdrawn (it is not that the theory is trivial, though that is where unqualified application of its rules would lead). A more thorough repair avoids γ altogether, and replaces the underlying logic by a paraconsistent logic (see §23 and chapter 5).

Several examples of neutrally and significance reformulated logics may be found in Slog, e.g. neutral significance arithmetic (p.528) and neutral significance class theory (p.602), along with many other examples of neutral theories, e.g. of existence (p.529). These examples are complicated however (by what is needed in the larger view, but not important for local application) significance reformulation. The neutral part of the reformulation is often trivial: that it is is an important element in the case for the thesis that mathematics is really existence-free. Consider, for example, the two main theories developed in Mendelson 64, formal number theory and axiomatic set theory NBG: both theories are first-order theories and may be trivially recast using neutral quantification logic as a base with neutral quantifiers. In neither case does the identity theory require adjustment: in system NBG (read in Australia at least, 'No Bloody Good') there are no primitive function parameters or subject constants and but one predicate, $\in$, which is assumed extensional: while in S, where an identity predicate is primitive, there are no other primitive predicates and the functions + (addition), x (multiplication) and ' (successor) are all transparent with respect to extensional identity.

The main illustrations in what follows will be different; they will consist of various versions of second order logic and of λ-categorial logics (Church's simple type theory refurbished). It is useful for subsequent discussion to divide logics into two parts:

1. The carrier logic, or pure structural logic, which is the logic of the parts of speech of the system and which includes the logics of implication and inference, and

2. The superimposed logic, or substantive[1] logic, which gives the objects of the theory.

Second-order logic illustrates the divison. All but the abstraction scheme (of the usual logic) belong to the carrier logic. But further distinctive axioms for objects, such as characterisation postulates, belong to the substantive logic.

Basic second-order logic results from quantificational, or first-order, logic Q by

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[1] Use of this term carries no commitment to the existence, in any way, of objects a logic supplies.

(i) relaxing a formation rule of Q so that predicate and sentential parameters - recast as variables - as well as subject variables, may be bound, i.e. by replacing the formation rule specifying how 'U' (read 'for every') can enter into wff by the rule:

> if A is a wff then (Uu)A is a wff, where u is any variable (subject, predicate, sentential).

(ii) replacing 'subject variable' whenever it occurs in the axioms and transformation rules of Q by 'variable' and using in these axioms and rules extra-systematic (or syntactic) variables which range over subject, predicate or sentential variables.

These extensions are, however, insufficient to yield a Henkin-complete second-order predicate logic (in the sense of a neutralised version of the Henkin-complete second-order logic investigated in Church 56). They yield only the carrier logic, which however merits separate display. Moreover, the elaboration required to get a Henkin-complete logic - which amounts to adding attribute abstraction schemes to the carrier logic (see below)[1] - enables important parallels for a logical theory of objects to be observed and drawn out, in particular the similarity of the addition of schemes for objects generally to schemes for certain sorts of objects, notably attributes. Such a similarity contributes nothing however to misguided attempts to reduce objects to attributes.

1. Second-order logics and theories, and a substitutional solution of their interpretation problem. The need to extend the logical framework beyond quantification logic at least to something like second-order logic has already been indicated: there is much that needs to be said in a theory of objects that cannot be expressed in Q (the full induction principle of Peano arithmetic and theses of universals theory are stereotyped examples of classical principles that cannot be adequately expressed in Q). In essence, second-order logic extends quantification logic just by allowing quantification over predicates; but it does not permit, what third and higher-order logics admit (in type restricted fashion), placement of predicates in subject positions - a move which raises further, and serious, interpretational problems. To put it bluntly, what sense does gf, e.g. '(is green) is red', make? None at all, it is not even grammatical.[2] Similarly with '(is green) is green', '(greenness) greenness', etc. A sentence requires both a subject, or subjects, and a predicate (both saturated and unsaturated expressions) and cannot be manufactured by concatenating two predicates or two subjects. To make sense of higher-order logics, implicit subject-predicate conversion principles have to be revealed. By stopping at the second order, in our ascent of the order hierarchy, we can let such sleeping problems lie. The effect, however, of higher-order theory can be obtained, in an admissible form, through conversion principles (see Slog, chapter 7).

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[1] Or equivalently extending substitution principles, as Church does: see the formulation of second-order logic in 56.

[2] The fact that a semantics can be provided for higher-order logics (e.g. in Henkin's fashion 49 and 50), or indeed for any logic (see §24), does not show that such higher-order logics make good sense, but that having such a semantics is no guarantee of making sense.

1.18 SECOND-ORDER LOGICS

The vocabulary of second-order logic 2Q, and of its carrier logic, and of all second-order theories, is the same as that of Q: it includes at least subject variables and predicate variables, and may include also subject and predicate constants, sentential variables and constants, and functional variables and constants. Likewise the operators are those of Q: &, ~, U.[1] The formation rules for wff or subjects are also the same as those for Q (those given in §16). The remaining formation rules are the following for wff:

i. An initial sentence (sentential variable or constant alone) is a wff, an elementary wff.

ii. Where $x_1,\dots,x_n$ are n wff and f^n is an n-place predicate, $(x_1,\dots,x_n)f^n$ is a wff, an elementary wff.

iii. Where A and B are wff, ~A and (A & B) are wff, but not elementary wff.

iv. Where A is a wff and v is any variable of any sort (subject, predicate, or sentential), (Uv)A is a wff, but not an elementary wff.

The postulates for the carrier logic 2QC are as follows (they are a neutral restatement of a weak second-order logic):

1. Sentential schemes: A ⊃. A & A, A & B ⊃ A, A ⊃ B ⊃. ~(B & C) ⊃ ~(C & A).

2. Quantificational schemes: (Uv)A ⊃ $S^{v}_{w}|$, where w is a parameter (or term) of the same sort (subject, predicate, or sentential) as u (Instantiation); (Uv)(A ⊃ B) ⊃. A ⊃ (Uv)B, where v is not free in A (Distribution).

3. Detachment rules: A, A ⊃ B $\rightarrow$ B (Material Detachment), A $\rightarrow$ (Uv)A (Generalisation).

Note that Material Detachment needs no qualification within the framework presented, since consistency can be proved in an appropriately finitary way. But for second-order theories in general, the rule does require qualification by a consistency provision.

There is a serious interpretational problem for the logic presented and for extensions of it, if the interpretation is an objectual or (differently) an entitative one. The problem (which is explained in detail in Slog 7.12, p.566 ff., where one resolution of the problem is also offered) is this: objectual quantification in the case of many of the forms 2QC admits as well-formed does not make sense; that is, the linguistic forms, so interpreted, are not significant. The problem is evident from attempts at English renditions of simple second-order wff such as (p)p and (f)xf which do not illegitimately introduce converting predicates, as the reading of (p)p as 'for every proposition p, p is true' does. The problem arises from treating, in the way objectual and entitative quantification requires, predicates and sentences as subject terms (see Slog, p.567).

The problem may be resolved, and nonsense sentences of second-order logic rendered intelligible, in various ways (ways that can be combined); for example, by transformation into attributive form (as in Slog, p.567 ff),[1] or by recourse to a liberal substitutional interpretation of predicate and sentence quantification (a way which again introduces subjects, but quotational subjects such as qu(f) and qu(p)). The second course will be pursued here: quantifiers and descriptors binding sentence and predicate variables will be interpreted substitutionally (or more exactly, in a generalised substitutional fashion); but operators binding subject variables will be interpreted objectually, as before. Such a mixed interpretation plan might be considered objectionable, but it is as nearly ideal as can be obtained for noneist purposes, and what is objectionable about it? An objectual interpretation is required for general and particular discourse about objects, to connect subjects with items of d(T), "language with the world". But such an objectual interpretation is not to be had or expected for other parts of speech, such as predicates, adverbs and punctuation marks, which at best yield subjects which are about objects after conversion (e.g. by prefixing by qu). A substitutional interpretation is however legitimate and useful for such parts of speech. Consider again the wff (p)p, i.e. (Up)p, which then reads 'for every (substitution upon) sentence qu(p), p', or 'p, whatever sentence qu(p) may be'.

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[1] One connective and one quantifier suffice. For example, given U and ⊃, ~ and & can be defined thus: $\Lambda =_{Df} (Up)p$; $\sim A =_{Df} A \supset \Lambda$; $A \,\&\, B =_{Df} \sim(A \supset \sim B)$.

Naturally the substitutions are confined to an admissible class, e.g. all sentence parameters or all constants of the given language. The intelligibility of universal quantification, as in (p)p, construed substitutionally can be seen from the intelligibility of particular cases: suppose, e.g. the substituting sentence is 'Snow is dirty-brown' (i.e. qu (Snow is dirty-brown)); then what is said is: Snow is dirty-brown. It is evident that (p)p is false, indeed necessarily false, since some substituting sentences express falsehoods. The matter is made clearer by the semantical rules than by the barbarous rendition in logicians' English. On the intended substitutional interpretation, (Up)p holds iff every substitution for p by a sentence parameter holds.[2]

More generally, a universal quantification (over sentences or predicates of a given adicity) holds if every one of its substitution instances holds, and a particular quantification holds if some of its substitution instances hold.[3]

Adoption of a substitution interpretation also has the real advantage of much simplifying and rendering more accessible semantics for second-order logics and their elaborations. A model for 2QC is exactly the same as a model for Q, namely a structure <T, D, I>.[4] The evaluation rules are those for Q together with the following rules:

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[1] For standard second-order logic omits some transformations crucial for its natural language intelligibility.

[2] The reading and interpretation differ from that considered in Slog, p.573, where what is considered is still an objectual interpretation, the objects being quoted sentences (or sentence "names"). Given a substitutional-style recasting the vacuous quantificational problem encountered disappears.

[3] The substitution is liberal because replacements are not restricted to constant expressions but can include other parameters, such as variables; see DS.

[4] As before T is dispensible, and if subjects are interpreted substitutionally D can be avoided also.

(i) $I((Uf)B, T) = 1$ iff $I(B(g/f), T) = 1$ for every predicate parameter g of the same adicity (i.e. number of places) as f;

(ii) $I((Up)B, T) = 1$ iff $I(B(q/p), T) = 1$ for every sentential parameter q.

If, for convenience, sentence parameters are treated as zero-place predicate parameters, then the additions required for the second-order logic reduce to rule (i). Observe that even though predicates are assigned a relational interpretation under I and this feature is used in the evaluation of elementary wff, the interpretation of predicate quantification is a liberal substitution one turning on predicate replacements, which connects only obliquely through inductive interpretational clauses with the relational assignments.

Validity and other semantical notions are defined as before for Q. An adequacy theorem, of precisely the same form as that for Q, that A is a theorem of 2QC iff A is 2QC valid, may be proved in a way that simply adds to the corresponding proof for Q (details are readily assembled from DS, p.623, or Leblanc 76, p.171 ff.).

Logics of around second-order can similarly be built on any of the extensional enlargements of Q considered in 1.17, e.g. upon $Q\xi$, $SQ\xi$, etc. The same also applies to logics or theories based on more substantial second-order logics, i.e. on what, seen differently, are second-order theories. A second-order theory is a formal system whose morphology (vocabulary and formation rules) is that of 2QC, whose axiom schemes include all those of 2QC and whose (primitive) rules are those of 2QC. A second-order theory is thus distinguished in general from the second-order logic 2QC by additional axioms - sometimes called proper axioms - in the vocabulary of 2QC. Naturally, constants may be singled out in a second-order theory for special treatment and the proper axioms will typically involve such constants (cf. the examples of first-order theories in Mendelson 64, p.58). An important class of second-order theories are those that can be distinguished roughly as second-order logical theories. Such systems (of which 2Q below is an example) do not involve axioms in special constants, but further axioms of a logical cast, such as abstraction schemes. For some indication of the variety of second-order logical axioms that can be considered, see Church 56, chapter V.

2. Substantive second-order logics with abstraction principles. A crucial principle for many logical purposes which is omitted from 2QC is the (unrestricted) abstraction, or comprehension, scheme

UAS. $(\underset{\sim}{x})(Pf)(\underset{\sim}{x}f \equiv A)$, with f not free in A.

Here f is a n-place predicate, for n a non-negative integer, and $\underset{\sim}{x}$ is a subject vector $(x_1,\ldots,x_n)$. The 0-place case yields the propositional scheme: $(Pp)(p \equiv A)$, with p not free in A, which enables the comprehension of a complex wff is a single parameter. The proviso on UAS is essential; otherwise inconsistency results from $(\underset{\sim}{x})(Pf)(\underset{\sim}{x}f \equiv {\sim}\underset{\sim}{x}f)$. Also the quasi-constructive character of UAS, that the scheme (somehow) produces a new predicate corresponding to A, and therewith a simple truth theory for 2QC and various extensions, are put in jeopardy should the proviso be removed (something which, though not a nontrivial possibility for second-order theory, becomes a serious matter with the rise of paraconsistent theory: see 10.1).

The system 2Q, i.e. 2QC + UAS, is simply consistent. This may be shown by essentially the finitary syntactical argument outlined in Church 56, pp.306-7; alternatively the result follows from the semantics to be given. The consistency of the theory depends essentially on formation restrictions, which prevent formation of such logical paradoxes as impredicativity that exploit occurrences of predicate parameters (or their conversions) in subject positions. One of the attractions of second-order theory 2Q is that it does allow unrestricted abstraction - but within the scope of its restrictive formation principles.

Logic 2Q is a neutral equivalent of the functional calculus F^2 investigated in some detail by Church 56. To establish the equivalence involves forging a deep connection that reaches far beyond merely 2Q and neutral F^2, a connection between abstraction principles and extended substitutional principles. In the case of 2Q which is typical the connection is this: UAS may be replaced by the following substitution schemes, the resulting system being deductively equivalent to the original:

UST. $(f)A \supset S^{\underset{\sim}{x}f}_{B}A|$,

i.e. $(f)A \supset A(B|\underset{\sim}{x}f)$. The complex conditions on substitution that are built into the notation are those explained in Church p.193, or (equivalently) in Leblanc 76, p.167. In the 0-place case the substitution scheme takes the familiar form: $(p)A \supset S^{p}_{B}A|$. In a similar way restricted abstraction principles correspond to restricted substitution principles. For example, a predicative restriction on B, to the effect that B is a wff of Q, in one principle transfers intact to the other principle (and conversely). Proofs of the deductive equivalences of the systems can be adapted from Leblanc 76, p.175 ff. (The proofs, due to Henkin, although simple enough in outline, become difficult when the recalcitrant substitution details are incorporated in all their nicety, or nastiness.) Thus UST is a theorem of 2Q.

Semantics for 2Q and for 2QP (the system which imposes a predicative restriction on abstraction) are a matter of appropriately varying the class of substitutions admitted in the evaluation rules for predicate and sentential quantification (cf. DS). The new rule for 2Q is, in essence:

$I((Uf)A, T) = 1$ iff $I(A(B|\underset{\sim}{x}f), T) = 1$
for every wff B (and where $\underset{\sim}{x}$ comprises distinct parameters).

For 2QP it is required that B be a wff of Q. Following Leblanc, p.167, call $S^{\underset{\sim}{x}f}_{B}A|$ a general instance of (Uf)A. Then the evaluation rule for 2Q is:

$I((f)A, T) = 1$ iff $I(A', T) = 1$, for every general instance A' of (f)A.

Validity is defined as for 2QC. Adequacy of the semantics for 2Q and 2QP (and for other intermediate systems) is proved like that for 2QC: for details see Leblanc, p.171 ff.

A simple consequence of the abstraction principle is that everything is an item, i.e. (M1) is a weak form. For a thing is an item iff it has some property; i.e. x item $=_{Df}$ (Pf)xf. But by UAS, (x)(Pf)xf; whence (x)x item.

3. Definitional extensions of 2Q and enlarged 2Q: Leibnitz identity, extensionality and predicate coincidence and identity. In contrast to first-order logic Leibnitz identity may be defined in second-order theory: $u \approx v =_{Df} (f).uf \supset vf$. The relation $\approx$ has all the expected properties, it is an equivalence relation which guarantees full intersubstitutivity. (For proofs and exact statements of substitutivity principles, see Church 56, p.301 ff.)

But one object of the noneist enterprise is to characterise not Leibnitz identity but extensional identity, for which a preliminary characterisation of extensionality is a desideratum. While, however, one can define in 2Q, ext(~), i.e. negation is extensional, ext(&), etc., one cannot define generally ext(Φ) where Φ is a sentence functor, since such functors are not included in the vocabulary. Fortunately 2Q can be enlarged, in a way that does not interfere with earlier results, by further predicate parameters which are not in term open to quantification. That is, the enlargement is like that in enlarging sentential logic to zero-order logic, and but a syntactical enlargement extending the system conservatively. (The result of the full addition of functors of functors, subject to no axioms and not open to quantification or other binding operations, is a logic of about order 2¼.)

The first enlargement of 2Q, part of system 2Q+, is then a stock of connectives of one or more places: Φ^1, Ψ^1,...; Φ^2, Ψ^2,...; ... . Examples are 'It is true that', 'It is believed that', 'Bill knows that', 'That ... confirms that ...', 'That ... entails that ...', etc. These will be written, as in English in the case of 1-place connectives, in front of the wff they cover (though there is some point in considering reverse notation here also, and some advantages in avoiding it). The formation rules are of this form: where Φ^n is an n-place connective (or functor), and $A_1,\ldots,A_n$ are n wff, then $\Phi^n(A_1,\ldots,A_n)$ is a wff. Then where Φ is a 1-place connective,

$$\text{ext}(\Phi) =_{Df} (p, q)(p \equiv q \supset. \Phi p \equiv \Phi q).$$

Similarly for n-place connectives: the definition,

$$\text{ext}(\Phi^n) =_{Df} (p_1,\ldots,p_n, q_1,\ldots,q_n)(p_1 \equiv q_1 \&\ldots\& p_n \equiv q_n \supset \Phi^n(p_1,\ldots,p_n) \equiv \Phi(q,\ldots,q_n),$$

define full extensionality, as applied to closed wff. (As before extensionality in each place can be defined.) The definition can be generalised, with a little complexity, to apply to predicate wff containing free variables, for all 'functors of functors' as it said.

$$\text{ext}(\Phi^n) =_{Df} (f_1,\ldots,f_n, q_1,\ldots,q_n)(\underset{\sim}{x}f_1 \equiv_{\underset{\sim}{x}} \underset{\sim}{x}g_1 \&\ldots\& \underset{\sim}{x}f_n \equiv_{\underset{\sim}{x}} \underset{\sim}{x}g_n \supset. \Phi^n(\underset{\sim}{x}f_1,\ldots,\underset{\sim}{x}f_n) \equiv \Phi^n(\underset{\sim}{x}g_1,\ldots,\underset{\sim}{x}g_n)),$$

where $f_1,\ldots,g_n$ are predicates of zero or more places (f_i agreeing with g_i) and $\equiv_x$ represents the universal closure on all the variables of vector $\underset{\sim}{x}$. The latter is an approximation to what cannot be formulated in usual object languages, but is perfectly admissible substitutionally and used frequently in metalogical investigations, a form quantifying over wff. The general definition, where $A \equiv_c B$ is the universal closure of $A \equiv B$ and Φ is n-place operator (coupled if necessary with operator variables) is:

$$\text{ext}(\Phi) =_{Df} (A_1,\ldots,B_n)(A_1 \equiv_c B_1 \&\ldots\& A_n \equiv_c B_n \supset. \Phi(A_1,\ldots,A_n) \equiv \Phi(B_1,\ldots,B_n).$$

Note that the definitions involving bound subject variables differ from classical definitions inasmuch as classically variables are at least existentially restricted: however the main forms of interest are those containing only closed wff. The generalisation to operators is so that it can be shown that quantifiers such as U are extensional. U is since

$A \equiv_x B \supset. (Ux)A \equiv (Ux)B.$[1]

Analogous accounts can be provided for other important classes of connectives. Thus, for instance, mod, for modal, is similarly defined upon strengthening initial equivalences to strict equivalences, e.g. in the simplest case: $\text{mod}(\Phi) =_{Df} (p, q)(\Box(p \equiv q) \supset. \Phi p \equiv \Phi q)$. Thus $\text{mod}(\Diamond)$, but $\sim\text{mod}(B_a)$, where B_a symbolises 'a believes that'. For epistemic functors the initial equivalences are covered by K_z, i.e. 'z knows that', for suitable z; etc. So begins a significant typology of connectives.

Definitions of extensionality have been given for the main components from which languages such as second-order systems are built. There is just one crucial omission from the point of view of characterising such notions as extensional identity and (then) extensional language, and so on; and that concerns predicates. Syntactical methods of defining the extensionality of predicates in the logical framework so far elaborated break down. The two most promising approaches are these:-

(1) Carnap's proposal (in MN): Use parallel definitions to those given for sentence connectives but with extensional identity in place of material equivalence in the initial places (cf. the definitions of referential transparency). But firstly the procedure is circular, and secondly there are counterexamples.[2]

(2) Routleys' proposal:[2] Define extensionality in terms of component-wise breakdown of a predicate, which reveals whether it involves a intensional functor, e.g. in the simplest case

$\text{ext}(f) =_{Df} \sim(P\Phi)(Pg)(xf \equiv_x \Phi xg \;\&.\; \sim\text{ext}(\Phi))$. But again there are (mostly contrived) counterexamples, and the method fails except for artificially restricted languages.

Thus (2), though like (1) a valuable guide to extensionality, is not decisive.

But while syntactical approaches appear to fail, semantical ones do not. As observed, intensional functors all involve other worlds (than the class of worlds they are being assessed at) in their semantical evaluation. This is what is distinctive about intensional functors. Accordingly the predicate ext will be taken as a syntactical primitive henceforth: it will hold of the functor it applies to at a given world a (i.e. $I(\text{ext}(\Phi), a) = 1$) iff the semantical evalution of Φ in general involves transfer from a (worlds).[3]

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[1] Descriptors are however still outstanding: they can be included by treating the final triple bar, ≡, as an (extensional) identity.

[2] See R. and V. Routley, 'Extensionality and intensionality', 1969, unpublished.

[3] Even this method has some pitfalls. For devious rules may be chosen for the evaluation of extensional functors. It would be sad to have to fall back on canonical (semantical) forms! Fortunately that appears unnecessary.

To illustrate; in virtue of the fact that for any possible world a, I(A & B, a) = 1 iff I(A, a) = 1 = I(B, a), I(ext(&), a) = 1; so because of the generality of a, $\Box$ext(&). Some principles which will be used in what follows emerge at once, e.g. ext(~f) iff ext(f). More important

(Ext P). A functor is extensional if it is defined in extensional terms only.

For if it is then its evaluation can never depart from the worlds where its evaluation began. It will follow using Ext P that ext(E), ext(=).

Another identity relation of some use subsequently that cannot be adequately defined in 2Q is predicate identity. Predicate identity, in contrast to property and attribute identity, is linguistic and language bound, is comparatively unproblematic, and is Leibnitzian in character (being like a type identity). Hence it is symbolised $\approx$. Strictly $f \approx g$ is a contraction of $qu(f) \cong qu(g)$ with the predicate $\approx$ absorbing the quotation functions. How to include predicate identity, a definition of which would involve, what is not available in 2Q+; quantification over predicates of predicates, can be inferred from the treatment of identity in first-order logic. Add $\approx$ (to 2Q+) as a primitive subject to the formation rule, where f and g are predicate parameters of the same adicity (zero or more) then $f \approx g$ is a wff, and subject to the postulates

≈1. $f \approx f$,

≈2. $f \approx g \supset. A(f) \supset A(g)$, subject to proviso I, bound variables now including predicate variables.

A suitable semantic rule is this: $I(f \approx g, T) = 1$ iff f is the same predicate as g.

A though $\approx$ can not be defined in 2Q in a way that is at all adequate as seen from the outside, e.g. when the logic is applied, from within it can be defined (up to $\equiv$). For consider accidental coincidence of predicates, in the sense of in fact having the same extension (i.e. class of values), symbolised ~, and defined: $f\sim g =_{Df} (x)(xf \equiv xg)$. Then $\vdash f\sim g \equiv. f \approx g$. One half is immediate from ≈2, and the other half derives by substitution. That 2Q+ makes no requisite discrimination, simply helps to reveal its inadequacy. But in this case the situation is not rectified - it is ameliorated - by going modal, by moving to $\Box$2Q. For necessary coincidence, sameness of intension in the Lewis-Carnap sense, $(x)\Box(xf \equiv xg)$, is not sufficient for predicate (or for that matter property) identity.

4. Attributes, instantiation, and λ-conversion. Much has been the talk in earlier sections of properties, relations, instantiation and so forth, but the formal theory so far advanced neither includes, nor can include fully, a direct representation of them. The introduction of attribute abstracts can however be profitably compared and contrasted with the introduction of λ-abstracts, which are in any case advantageous in several parts of the theory, beginning with the representation of complex predicates.[1] And λ-abstracts

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[1] The calculus, due to Church, has several other important roles, some of which are expounded in §24, where the full calculus is introduced. Others are in providing a precise account of the connection of functions and their values, and in enabling a definition of λ-definability, an equivalent of general recursiveness.

offer an attractive way of trying to rectify the omission of attribute abstracts, *despite* their different grammar.[1] Where $A(x)$ is a wff containing just x free, $\rho x A(x)$ is the property of all and only these elements x that satisfy A; whereas $\lambda x A(x)$ is the predicate applying to exactly those objects which are truly A. Thus $\rho x A(x)$ is a *subject* term: $\lambda x A(x)$ a *predicate* term. The same points apply to the n-place case where n variables are bound by operators ρ and λ, yielding $\rho x_1 \ldots x_n A$ and $\lambda x_1 \ldots x_n A$. Thereby also the formation rules for λ and ρ terms are indicated: where A is a wff and $x_1,\ldots,x_n$ are n distinct subject variables, $(\lambda x_1 \ldots x_n A)$ is a (complex) predicate term and $(\rho x_1 \ldots x_n A)$ is a subject term.

The postulates for λ-abstracts are Church's rules for λ-conversion. But in logics with a suitable implication connective the rules for λ conversion can, equivantly, be replaced by an axiom scheme of the following sort:

$$\lambda AS. \quad (y_1,\ldots,y_n)(\lambda x_1 \ldots x_n A) \equiv S^{x_1 \,\cdots\, x_n}_{y_1 \,\cdots\, y_n} A|$$

the substitution notation representing simultaneous substitutions (which may be broken down into a finite sequence of single substitutions,[2] and so) which may be alternatively expressed $A(y_1|x_1,\ldots,y_n|x_n)$ or $A(y_1\ldots y_n|x_1\ldots x_n)$. Thus, e.g., $y(\lambda x\; x \sim f) \equiv y \sim f$; $(y_1,y_2)\lambda x_1 x_2(x_1 f x_2 \;\&\; \sim x_2 f y_1) \equiv y_1 f y_2 \;\&\; \sim y_2 f y_1$. More generally, $(y_1,\ldots,y_n)$ are (satisfy the predicate) $\lambda x_1\ldots x_n A$ iff $A(y_1\ldots y_n)$, variables being duly adjusted.

The axiom scheme reflects the intended interpretation of $\lambda x_1\ldots x_n A$ as an n-place predicate term which is true of precisely those ordered n-tuples of items which satisfy A. From this prescription the semantics of λ-abstracts can be worked out (cf. §24 below).

In fact there is no need to introduce λ as a new primitive conforming to λAS; for it can be had for free in $2Q\approx$. Define $\lambda x_1\ldots x_n A$ by identity as follows:

$$\lambda x_1\ldots x_n A \approx f =_{Df} (Ux_1,\ldots,x_n)((x_1,\ldots,x_n)f \equiv A).^3$$

Then $\lambda x_1\ldots x_n A$ is well-defined; for in the requisite sense, for some unique f, $(Ux_1,\ldots,x_n)((x_1,\ldots x_n)f \equiv A)$. The latter follows from the abstraction axiom and the postulates on $\approx$. Hence upon taking f as $\lambda x_1,\ldots x_n A$, by the definition and ≈ 1, $(Ux_1,\ldots,x_n)((x_1,\ldots,x_n)(\lambda x_1\ldots x_n A) \equiv A)$, whence λAS follows upon instantiation.

λ-abstraction, by enabling the definition of complex predicates, gives an *approximation* to property and attribute abstracts. For example, (internal) property negation can be approximated by $\bar{f}$ defined $\lambda xx{\sim}f$. Then, by λAS, since $y\bar{f} \equiv (y)(\lambda xx{\sim}f)$, $y\bar{f} \equiv y{\sim}f$. Why not introduce ρ itself to the job?

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[1] Because of the common confusion of properties and predicates λ-abstracts are often treated mistakenly as property (or worse) set abstracts.

[2] λ-abstraction may also be analysed into a sequence of operations, $\lambda x_1\ldots x_n A$ into $\lambda x_1(\lambda x_2\ldots(\lambda x_n A)\;\ldots)$.

[3] Observe that there is an unfortunate visual coincidence between the reverse notation and abbreviated quantifier notation which becomes conspicuous in expressions like $(y_1,\ldots,y_n)(y_1,\ldots,y_n)f \equiv \ldots)$. Sentence context does however always guarantee distinctness.

The operator ρ (like λ) could have been introduced into first-order logic, in an interesting way, in combination with the instantiation symbol i, to yield the virtual theory of attributes. The basic definitional equivalence is simply

ρDS. $(y_1 \ldots y_n)$ i $\rho x_1 \ldots x_n A \equiv A(y_1 \ldots y_n | x_1 \ldots x_n)$.

A comparison of λAS and ρDS should reveal at once why ρ and λ have often been conflated: they differ only in the insertion of instantiation predicate i, which is easily lost sight of, and is commonly enough paraphrased in or out. The virtual theory of attributes which has a nice formal development, largely parallelling Quine's elaboration of the virtual theory of sets, simply introduces ρ-terms by ρDS: it does *not* also admit ρ terms as subjects, a damaging admission, since it opens the way to logical paradoxes. The way is complete if i is taken as wff-forming on object terms. That is, where t_1 and t_2 are subject terms t_1 i t_2, i.e. (t_1) i t_2, is a wff. Then ρDS yields impredicativity paradoxes. For consider, e.g.

y i ρx~(xix) ≡ ~(y i y). Then ρ- i ρ- ≡ ~(ρ- i ρ-), which leads to inconsistency and triviality.[1]

The full admission of property and relation abstraction, along with i, will have to await the development of paraconsistent theory of §23.

Scheme ρDS, which can be definitionally introduced at no cost, will however be occasionally exploited. Sometimes too attribute variables ψ, φ, ... replacing abstract terms will be introduced. But in the second-order framework these additional variables are always eliminable, e.g. (Uψ)(x i ψ ⇔ y i ψ) which amounts to (Uρzzf)(x i ρzzf ⇔ y i ρzzf) for some abstract term ρzzf, translates to (Uf)(xf ⇔ yf). As the use of abstract variables is informal, exact translation rules are not given.

5. *Axiomatic additions to the second-order framework: specific object axioms as compared with infinity axioms and choice axioms*. The formal investigation of second-order logics, especially that yielded by the principal Henkin interpretation in the domain of natural numbers, and that influenced by mathematical applications, often leads to the addition of further independent axioms, *not* containing any new primitive symbols beyond those of the pure logic 2Q. The more immediate and familiar of these axioms are axioms of choice and of infinity (both sorts are studied briefly in Church 56).

The further axioms of prime interest for a logic of objects are not neutral versions of infinity and choice, but axioms supplying details of *specific* objects, Characterisation Postulates. These fall roughly into two classes, those for higher order objects such as abstraction axioms, and those for bottom order objects. The matter of postulates for higher order objects is taken further in chapter 5; what is of more immediate interest are Characterisation Postulates for bottom order objects, or *Specific Object Axioms* (SO axioms or SOA).[2]

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[1] For this reason property and attribute abstraction *is* approximated elsewhere in the book by λ-abstraction; e.g. λxxE stands in for ρxxE, i.e. existence.

[2] The nice term 'object axiom' derives from Parsons 78.

Neutral (second-order) logic requires but one - major - addition to afford a basic logic of objects, and that consists in the addition of specific object axioms. The addition of object axioms to neutral second-order theories closely resembles the classical addition of axioms of infinity (as in Church 56, p.343); and indeed SO axioms can (but needn't) yield axioms of infinity. For given that a system includes denumerably many distinct characterising predicates, by a core object axiom, (Px)xf, when f is characterising, and identity principles, the upshot is denumerably many objects. Such a pure second-order object axiom follows at once from (ιxxf)f for f characterising. However SO axioms give more information than axioms of infinity, e.g. they say which properties particular objects have - hence the term 'specific'. In two other respects also, the comparison with infinity axioms is helpful. Firstly, there are various different nonequivalent axioms that can be chosen as axioms of infinity in a second-order setting (Church lists 5, and remarks that it is not to be expected that axioms of infinity be equivalent, and that in fact there is no weakest axiom of infinity, pp.344-5):

So it is also, it is beginning to appear, with specific object axioms. Secondly, it is impossible to provide finitary (and in a certain sense, absolute) consistency proofs for systems with axioms of infinity; so it is also with certain theories of objects with a suitably denumerable language.

A central question for the logic of objects, the precise forms of and qualifications on SO axioms is considered in §21. One CP which has however been repeatedly encountered in particular cases is Meinong's version, a natural generalisation of which is: A(ξ x A) for suitable (characterising) A. This SO axioms bears direct comparison with axioms of choice, and can indeed be accounted a (weak) axiom of choice.[1] But so far the axiom in question is not directly formalisable in the second-order logics, elaborated, since ξ is not strictly included. It is time to rectify that omission.

6. Choice functors in enlarged second-order theory. The first-order ξ theory transfers intact to a second-order setting. The second-order theory developed could just as easily have been based on SQξ as Q (only the new theory would not strictly be second-order, but would add to the second-order scheme of things the description ξ). The useful system 2Qξ, which is the union of 2Q with Qξ or SQξ, may be axiomatised in various ways. A simple way is to add UST and Generalisation to SQξ. Semantics for the resultant system is a straightforward amalgamation of the respective semantics of its component systems.

What does raise new issues is the application of ξ to predicate and sentential variable, as in ξfA and ξ_pB i.e. higher-order ξ terms. From a truth-valued viewpoint the applications make sense. Where we can have all predicates or some sentences, we can surely have an arbitrarily selected predicate. The logic 2Qξ^2 with higher order ξ functors, simply adds to 2Qξ, as well as formation rules for higher order ξ terms, the appropriate ξ schemes, namely A(h) $\supset$ A(ξfA), where h is a higher order term of the same adicity as f. The truth-valued semantics for ξ indicated in 1.17(9f) may be adapted. Some difficulties with ξ come however when the systems are intensionalised.

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[1] Most obviously the CP in question is Aξ, which is usually reckoned a choice axiom, but with a different qualification. Compare too the second-order choice scheme Church presents (56, p.341, n. 555) which is tantamount to a predicate ξ scheme.

7. Modalisation of the theories. As before, a purely extensional logic[1] is seriously inadequate, not just philosophically but also (as is argued in chapter 10) in mathematics and for use in the theoretical sciences. One step beyond the extensional (almost the only step to be observed in the literature, such is the influence of the entrenched theory on what is investigated) lies the modal. Normal modalisation of second-order logics, and indeed of higher-order logics and type theories is, syntactically at least, straightforward.[2]

The recipe for a (Barcan) T modalisation (i.e. a modalisation of the order of Feys' modal system T) of almost any of the systems previously considered, and of very many other systems, is as follows:- Add to (a classically-based formalisation of) system L to obtain $\Box_T L$

(1) the modal postulates of T, namely $\Box A \supset A$, $\Box(A \supset B) \supset. \Box A \supset \Box B$, $A \twoheadrightarrow \Box A$ (necessitation);

(2) Barcan wff for each different sort of quantifiable variable of the system.

For example, in the case of 2Q, $\Box$2Q includes the Barcan schemes, $(x)\Box A \supset \Box(x)A$, and $(f)\Box A \supset \Box(f)A$, where f is a predicate of zero or more places. Comparable S5 modalisations are even simpler, since Barcan wff are derivable in S5 settings. An S5 modalisation $\Box_{S5}L$ just adds the postulates of S5, which are those of T together with $\sim\Box A \supset \Box\sim\Box A$.[3]

Nor is the semantical analysis of second-order modal logics difficult, provided sense is made of such systems by a truth-valued approach to predicate and sentential quantification. (By comparison fully objectual "semantics" are much more complex.) Several second-order modal systems may be considered at once by using the notion of an appropriate instance, corresponding to instantiations permitted by (derived) predicate substitution schemes of the respective systems. For example, $\Box_S$2QC an appropriate instance is a predicate parameter of the same adicity, $\Box_S$2Q an appropriate instance is a general instance in Leblanc's sense (extended unproblematically to cater for modal functors). A model for an S modalisation of a second-order system L, i.e. for $\Box_S L$, is just a model for SQ. For example a model for an S5 modalisation of 2Q, i.e. for system $\Box$2Q (abbreviating $\Box_{S5}$2Q), is an S5Q model. To complete the modelling it suffices to add these interpretation rules, of a substitutional sort, for predicate quantifiers (for predicates of zero or more places):

$I((Uf)A, a) = 1$ iff $I(A', a) = 1$ for every appropriate instance A' of $(f)A$.

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[1] Such a logic may admit certain nonextensional applications, as discussion of the problem of filtering out initial intensional predicates, in the assessment of extensional identities, has revealed. Such an admission of nonextensional initial predicates is of course no adequate substitute for an explicit theory of modality.

[2] A normal modal logic is semantically one that includes no nonnormal worlds, i.e. for which N = K. This condition models the necessitation rule, $A \twoheadrightarrow \Box A$, which is the (almost) characteristic feature syntactically, and a required feature for straightforward modalisation of classical systems which does not transform classical axioms.

[3] For S5 modalisations of type theory, and semantics therefore, see especially Bressan 74.

Then for many second-order modal logics, theoremhood coincides with validity. Proof of soundness is the usual case by case affair which assembled constitutes on inductive proof. Fortunately many of the cases are already taken care of in the underlying quantified modal logic or (in effect) in second-order logic. But one use that may not be so accounted for is the matter of the validity of predicate Barcan wff. Suppose otherwise then it is not valid. For some world a in some (putative counter-)model, I((f)□A, a) = 1 ≠ I(□(f)A, a). Hence for some world b in K, Rab and I((f)A, b) ≠ 1. Thus for some appropriate instance A', I(A', b) ≠ 1. But as I((f)□A, a) = 1, I(□A', a) = 1 (since connectives, which do not bind varibles, do not interfere with instances), whence as Rab, I(A', b) = 1, which is impossible. The completeness argument is an elaboration of that for the underlying quantified modal logic, really of that given in 1.17 for S2Q. The elaboration is like that for second-order logic, only world relativised. What is new that has to be shown (working back from the conclusion) is that in a canonical model

(Uf)A ∈ a iff A' ∈ a, for every appropriate A'. The left-to-right half is immediate, since a is suitably closed, from the theorem (Uf)A ⥽ A'. The converse half follows from the quantifier completeness of a, something that follows in turn from an enlargement of a main extension lemma to cater for predicate quantification.

Where the underlying quantified modal logic includes ξ-terms, as well as or in place of standard neutral quantifiers (of constant domain character), constancy of domain, is again modified as for the semantics of the underlying logic (see 1.17). Otherwise matters are much as before. The introduction of ξ-terms formed from predicates, i.e. expressions of the form ξf A, does lead however to some new issues. Given the substitutional explanation and interpretation of quantifiers, there is, as noted, no excluding a parallel explanation of descriptors, e.g. of choice operators; for instance, given an expression of the form A(f), a term ξf A(f), signifying an arbitrarily chosen linguistic unit, a predicate, for which A(f) holds. But if such complex predicates are admitted, there are repercussions in the quantifier theory. For example, an ξ predicate term guarantees (Pg)((Ph)xh ⥽ xg) which is not a theorem of □2Q. Thus two contrasting sets of quantifers can be obtained in the larger ξ theory, standard quantifiers which exclude ξ-terms as instances and wider quantifiers like those of LR systems, which allow ξ-terms as values. Both have their valuable uses, and there is no reason why they should not both be had. Since the narrower, constant domain quantifiers have already been investigated (to some extent), let us consider the stronger quantifiers that can be defined in terms of ξ, and the logic of ξ itself. The latter is (or can be, given that additional substitution requirements can be obtained by way of abstraction principles) as before, namely

$A\xi^2$. A(f) ⥽ A(ξfA).

The corresponding substitutional semantics, which in their present form at least leave something to be desired, are essentially those already indicated in 1.17 (for more details see PLO, p.185).

The additions and enlargements made to 2Q can, in general, be carried over to □2Q. For example, predicate identity, ≈, can be introduced as before: its axiom schemes will then hold necessarily in virtue of the necessitation rule. Then λ-abstracts can be defined as before, whence it follows, what characterises λ in modal contexts,

$(y_1,\ldots,y_n)(\lambda x_1\ldots x_n A)$ ⥼⥽ $A(y_1\ldots y_n|x_1\ldots x_n)$.

1.19 EXISTENCE AND POSSIBILITY PREDICATES

Though modalisation is a necessary step it is only a first step in the requisite intensionalisation of logic. A further and more significant step is the introduction of a satisfactory entailment relation which paves the way also for that very important class of intensional functors of the order of strength of coentailment (see the examples cited in 11.2). But there are several unresolved problems in the application of entailment as the basic deducibility connection in advanced logical theory (e.g. the annoying matter of a satisfactory theory of restricted variables); so the logical developments that follow are built primarily on that inadequate substitute for entailment, namely strict implication. Only in §23 is entailment introduced and some of its role indicated. In a more satisfactory theory (which concerted non-classical work would no doubt produce) entailment would replace strict implication which would be phased out: even so strict implication would of course be definable (as, e.g., that minor connective exclusive disjunction is), since a philosophically and scientifically adequate theory is just bound to include such modalities as necessity, possibility and contingency.

§19. *On the possibility and existence of objects: second stage.* Some items are possible and some are not, some items exist and some do not (§17). With introduction of the logical predicates E ('exists', 'is an entity') and $\Diamond$ ('is possible') these claims can be symbolised and some of their logical relations formulated or derived. For instance (as in §17), 'Some items do not exist' is symbolised '(Px)~xE' and 'Kingfrance does not exist' 'k~E', and that k~E entails that (Px)~xE, but that (Px)~xE does not entail (Px)xE. But in a purely quantificational setting much of what needs to be said cannot be said; for example, without modality one cannot say that it is only contingently true that things exist, and without the equivalent of second-order quantifiers one cannot explicitly[1] state even the Ontological Assumption in the form that whatever has some properties exists, much less formulate and assess many of the many definitions of existence that have been proposed.

A fundamental question in ontology is: can the predicates 'E' and '$\Diamond$' be defined? More specifically, can they be defined using the logical apparatus already introduced? The questions cannot be exactly settled until a set of conditions of adequacy on proposed definitions is adopted. However not only would several of these conditions be controversial; also their very statement presupposes the correctness of certain sorts of theories. For instance, the condition of adequacy on a definition of 'E' that (Px)~xE should be a thesis legislates against classical theories, in which (Px)~xE cannot be satisfactorily formulated. The situation is even worse with respect to the predicate $\Diamond$. However some conditions on E, such as that (Px)xE and (Px)∇xE should be theses, are virtually unquestioned. Another more important condition, supported by nonthomistic philosophical tradition, may also be stated in a theory neutral way, namely that it is contingent that what does exist exists, i.e. given xE, ∇xE. This requirement may be approximated in classical logic by the formula ∇($\exists$x)(xf v ~xf), i.e. it is a contingent matter that the universe is not empty: but to bring this formula out as a thesis would require a very different modalisation of classical logic from standard modalisations. In contrast the Meinongian condition on E that $\Box$(Px)~xE should be a thesis is not strongly supported by philosophical tradition, cannot be formulated in a theory-neutral way, and would certainly be repudiated by those who aver that everything does exist. In sum, the issue of definition is not going to be tightly confined, let alone settled, by drawing up an uncontroversial set of conditions of adequacy. The theory of items will have to set and defend its own conditions of adequacy. The severe limitations to the vaunted neutrality of logic become very conspicuous. The limitations will appear again and again with each substantive issue that is touched: identity, descriptions, abstractions, assumptibility, and so on.

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[1] As distinct from a schematic approximation, pushing the quantifiers into the metalanguage.

It by no means follows, of course, from the fact that conditions of adequacy, like definitions, are controversial and can always be disputed, that conditions, and proposed definitions satisfying disputable or disputed conditions of adequacy, cannot be satisfactorily defended. In what follows definitions of existence and possibility meeting the minimal conditions of adequacy so far adduced will be considered and defended and at the same time further conditions of adequacy will be derived.

1. Item possibility: consistency and possible existence. Unlike the case of existence, where a variety of competing definitions have been proposed, few considered definitions of item possibility are to be found in the literature. However one or other (sometimes both) of two definitions is commonly assumed:

D◊1. x◊⃒ $=_{Df}$ ◊xE, i.e. an item is possible iff it possibly exists;

D◊2. x◊⃒ $=_{Df}$ ~(Pf)(xf & x~f), i.e. an item is possible iff it has no contrary, or incompatible, features.

Observe that it would be an error to define possibility in terms of external negation (at least in the general logical framework argued for which retains LNC;[1] for then the erroneous thesis of classical rationalism, that every object is possible, would follow at once, since (f)~(xf & ~xf) by LNC: whereas many objects are not possible. Other definitions are soon suggested by these definitions or by other accounts in the literature. For example, D◊1, together with the classical connection xE iff (∃x)xf, yields

D◊3. x◊⃒ $=_{Df}$ ◊(∃f)xf,

and together with the nonplatonistic connection xE iff (Pf)xf, leads to

D◊4. x◊⃒ $=_{Df}$ (Pf)◊xf.

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[1] In paraconsistent logics which reject LNC there are other options for defining possibility.

Nor do the definitions discussed by any means exhaust the accounts that might be proposed. An appealing suggestion, in the spirit of Meinong, that came to hand after this section was drafted is Parson's definition (in 78), according to which an object is possible iff it is possible that an existent object has all the nuclear predicates it actually has; in symbols x◊⃒ iff ◊(∃y)(chf)(Actually xf ⊃. yf). The account, which is complicated (unnecessarily?) by the use of an Actuality connective, loses some of its initial appeal however by the restriction to nuclear predicates that is imposed. For, on the face of it (though presumably not within the confines of Parson's theory), an object that is possible as far as its nuclear features go may be rendered impossible by some extranuclear features it has. If the restriction to nuclear predicates is removed, another restriction, that to extensional predicates, will be wanted.

Extrapolation of the impossibility definition commonly adopted for propositions, namely ~◊p iff p ⥽ Λ, where Λ is some logical falsehood, to all objects either leads back to D◊4, or else leads to a strengthened version of D◊4,

x⟠ $=_{Df}$ (Uf)◊xf

as follows: ~x◊ iff (Pf)(xf ⥽ Λ), i.e. iff (Pf)~◊xf, since ~Λ is logically true, whence x⟠ iff (f)◊xf. But then, by abstraction, ◊(xg & ~xg); so (x)~◊x, i.e. everything is impossible. So the strengthened version of D◊4 had better be rejected, since it violates a minimum condition of adequacy, namely (Px)x⟠.

Each of D◊2 - D◊4 requires qualification, either explicitly to exclude certain intensional properties or through an interpretational equivalent (e.g. restricting properties to extensional properties). But the explicit and honest course we have been following is, as usual, best. Such a qualification is essential, because (to take D◊2) one cannot render an object impossible by having or adopting inconsistent propositional attitudes towards it, e.g. by thinking inconsistently about it. Likewise, to take now D◊4, an object cannot be rendered possible by appropriate attitudes towards it being adopted; that someone can think of, or conceive, the round square does not make it possible.[1]

In fact D◊4 and D◊3 can be eliminated without further ado because they render some impossible objects possible. Consider the rather indeterminate coloured round square (I am now thinking of). It is possibly blue, i.e. it is possible that it is blue. Thus according to D◊4 that round square is possible; but obviously it is an impossible object. D◊3 may be similarly disposed of if any properties exist, or (with a slight variation) possibly exist; while if no properties possibly exist, the definition would render all objects impossible, violating minimal adequacy conditions.

Various restrictions of the quantifier of D◊2 suggest themselves, the most promising being to extensional and to modal properties. The basic definition then, from which others will be obtained by variation, is as follows

◊1. x⟠ $=_{Df}$ (U ext f)~(xf & x~f).

Important variations are

◊2. x⟠ $=_{Df}$ (U ext f)~◊(xf & x~f),

i.e. an object x is possible iff it is not logically possible that x both has and lacks f, for any trait f;

◊3. x⟠ $=_{Df}$ (U mod f)~(xf & x~f); and

◊4. x⟠ $=_{Df}$ (V mod f)~◊(xf & x~f).

In defence of the basic definition ◊1 consider the equivalent formulation of it: ~x⟠ iff (P ext ψ)(x i ψ & x~ιψ). First, the RHS (right-hand side) entails the LHS: for if an item both has and lacks some trait then it cannot be a possible item. Conversely, if an item is not a consistent one this inconsistency will be shown up (is bound to be shown up) by some trait which it both has and lacks. Again it must be a trait (an extensional property), because it is common enough for people to hold inconsistent beliefs even about entities and the like.

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[1] Cf. Reid's refutation of a long tradition in philosophy, which tied possibility to (human) conceivability, discussed in 12.1.

A weakness of ◊1 (and similarly of ◊3) is that it does not guarantee that item possibility is a logical notion, e.g. that x⟠ iff □x⟠; thus too it prevents, what might be considered desirable (it is not), a reconciliation with D◊1, according to which also x⟠ iff □x⟠ (using S5 principles). This trouble ◊2 removes. One half of the condition deriving from ◊2, ~x⟠ iff ◊(P ext ψ)(xιψ & x~ιψ), follows from ◊1. In defence of the further half of ◊2 - which is tentatively adopted as a working definition - it can be argued that if it is possible that an item both has and lacks a given trait then in some world the item must be an inconsistent one, and, hence since its logical properties cannot change from possible world to world (if the worlds are S5-like in structure), the item is in fact impossible. It is, as remarked, a merit of the stronger definition that it makes item possibility a fully logical notion, in the sense that if an item is possible [impossible] it is as a matter of logical necessity possible [impossible]: modal matters are logical matters.[1] The meritorious S5 features of ⟠ are exhibited in the following tiny theorems, according to which an item is possible iff it is necessarily possible and iff it is possibly possible: ⊢□x⟠ ⇔ x⟠; ⊢◊x⟠ ⇔ x⟠; ⊢□x⟠ ⇔ ◊x⟠. An item is possible in some possible world iff it is possible in all possible worlds.

By the ◊ definitions and the definition of itemhood, ⊢x⟠ ⥽ x item, i.e. possibilia are, as expected items (the relation is indeed an entailment). The converse naturally does not hold, and may be refuted once Characterisation Postulates are introduced. For then an item which is round and not round is an item, but an impossible one, since roundness is a trait. Possibilia (under ◊ definitions) are items that satisfy predicate LNC for traits as well as sentence LNC. Although ⊢x⟠ ⥽ (Pψ)◊xιψ, the converse, a possibility form of the Ontological Assumption (embodied in D◊4) is false. For a round square is round, and therefore possibly round, but it is not possible. With Characterisation Principles, counter-examples can again be made fully logical.

A definition of ⟠ does not fully determine the logical behavour of ~⟠, though certain definitions, notably ◊4, constrain it. The connective ⟠ as defined in ◊2 and ◊4 is not (on the face of it) extensional, but it is modal. Hence instantiating with ⟠, x⟠ ⥽. x⟠ ⥽ ~x~⟠, whence x~⟠ ⥽ ~x⟠. But the converse does not appear to follow, presumably because of lack of an appropriate condition on predicate negation in such sentence contexts. However the following definition can consistently be adopted: x~⟠ $=_{\mathrm{Df}}$ ~x⟠, and appears to be correct. Its adoption yields at once such tiny theorems as ⊢x⟠ ⥽ ~◊x~⟠ and ⊢~⟠ ⥽ x⟠.

Whichever way a logical notion of item possibility (i.e. a notion such that x⟠ iff □x⟠) is introduced, good use can be made of it in formalising and explicating what the older (and mostly wiser) logicians had to say. For example, the modal hexagon, inherited in essence from the scholastics, can be fully recovered. Possibility quantifiers - the wide quantifiers of the traditional rationalist - may be defined (using classical restricted variables) thus:

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[1] Anyone who objects to item possibility of this logical sort, who thinks that it is perfectly possible that a consistent item in fact have inconsistent traits, will of course reject ◊2 and prefer to work with ◊1, which does not have these S5-type features.

$$(\Sigma x)A(x) =_{Df} (Px)(x\Diamond \;\&\; A(x)); \qquad (\Pi x)A(x) =_{Df} \sim(\Sigma x)\sim A(x).$$

The more satisfactory definitions from which these derive are in terms of $(Px \ni x\Diamond)A(x)$ and $(Ux \ni x\Diamond)A(x))$. Σ reads 'for some possible item', Π 'for every possibilium'. It follows, $\vdash (\Pi x)A \leftrightarrow (Ux)(x\Diamond \supset A)$; whence the Π-interpretation result, $\vdash (\Pi x)x\Diamond$, is immediate. The principal logical relations upon combining possibility quantifiers Π and Σ with modal operators $\Box$ and $\Diamond$ - relations that follow in first-order modal theory - are summed up in the modal hexagon (adapted from Kneale[2], 62, p.614):

$$\begin{tikzcd}
 & & (\Pi x)\Box A(x) \arrow[ddll] \arrow[ddrr] \arrow[d, leftrightarrow, "④"] & & \\
 & & \Box(\Pi x)A(x) \arrow[dl] \arrow[dr] & & \\
(\Sigma x)\Box A(x) \arrow[r, "③"] & \Box(\Sigma x)A(x) \arrow[dr] & & \Diamond(\Pi x)A(x) \arrow[dl] \arrow[r, "①"] & (\Pi x)\Diamond A(x) \arrow[ddll] \\
 & & \Diamond(\Sigma x)A(x) \arrow[d, leftrightarrow, "②"] & & \\
 & & (\Sigma x)\Diamond A(x) \arrow[uull] & &
\end{tikzcd}$$

The arrows indicate strict, or material, implications. Theorems ① and ③ and the following halves of ② and ④,

(i) $\vdash \Diamond(\Sigma x)xf ⥽ (\Sigma x)\Diamond xf$, and

(ii) $(\Pi x)\, xf ⥽ \Box(\Pi x)xf$

follow using the logical character of item possibility and the modal hexagon specifying relations upon combining neutral quantifiers with modalities. The remaining halves of ② and ④ follow using the strict theorem, $\vdash x\Diamond \;\&\; \Diamond A(x) ⥽ \Diamond(x\Diamond \;\&\; A(x))$,[1] proved by contraposition from the following:

$\sim\Diamond(x\Diamond \;\&\; A)$ $⥽.$ $x\Diamond ⥽ \sim A$

$⥽.$ $\Box x\Diamond ⥽ \Box\sim A$, by the distinctive S3 theorem

$⥽.$ $x\Diamond ⥽ \sim\Diamond A$

$⥽.$ $\sim(x\cdot \;\&\; \Diamond A)$

The correctness of the theorem depends essentially on the logical character of $\Diamond$. Otherwise, upon taking as replacement value of x 'what Tom is thinking about' and as A( ) 'is impossible', the following counterexample results: since what Tom is thinking about is possible though it is possible that what Tom is thinking about is impossible, it is possible that what Tom is thinking about is possible and impossible - which is impossible.

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[1] Footnote on next page.

It is a common assumption that the consistency-style account of item possibility so far concentrated upon coincides, or should coincide, with the possible existence account, D1. By contrast, such an assumption is not made for those special objects, propositions, to which it often claimed - with little in the way of worthwhile justificatory argument - modalities such as possibility are restricted. Platonists would have it that all propositions, including inconsistent ones, exist; and fellow-travellers are prepared to admit that inconsistent propositions at least possibly exist. But surely inconsistent objects, even abstract ones, cannot possibly exist. To go further, and spring one of the surprises of noneism: abstract objects, whether consistent or not, cannot possibly exist. The argument for this thesis will gain a prominent place subsequently (in chapter 9). But it is not difficult to observe the gap between consistency and possible existence through such properties as non-existence, which is a consistent notion but cannot possibly exist (see the detailed argument of NE). The immediate point is that such divergent viewpoints as platonism and noneism would lead to a divergence between possible existence and possibility in the consistency form; for example, according to noneism such objects as natural numbers though possible (and presumably objects of a consistent theory) do not possibly exist. Even so, some reconciliation of possible existence and possibility can be obtained by minor adjustment (fiddling, if you like, not fine tuning) of a definition of 'exists'[1] to which classical theory naturally leads when expanded in a naive way to take account of nonexistence.

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[1] (Footnote from previous page.)

This theorem, which depends on features of strict implication, fails for entailment. Thus without a further assumption guaranteeing $P\,x\Diamond \;\&\; \Diamond A(x) \Rightarrow \Diamond(x\Diamond \;\&\; A(x))$, only a reduced modal hexagon emerges for entailment, viz.

$$\begin{tikzcd}
 & & (\Pi x)\Box xf \arrow[ddll, dash] \arrow[ddrr, dash] \arrow[d] & & \\
 & & \Box(\Pi x)xf \arrow[dl, dash] \arrow[dr, dash] \arrow[u, dotted] & & \\
(\Sigma x)\Box xf \arrow[r] \arrow[ddrr, dash] & \Box(\Sigma x)xf \arrow[dr, dash] & & \Diamond(\Pi x)xf \arrow[r] \arrow[dl, dash] & (\Pi x)\Diamond xf \arrow[ddll, dash] \\
 & & \Diamond(\Sigma x)xf \arrow[d] & & \\
 & & (\Sigma x)\Diamond xf \arrow[u, dotted] & &
\end{tikzcd}$$

The arrows indicate entailment relations. Connections on the full modal hexagon which fail (the converses of (i) and (ii)), are indicated by dotted lines.

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[1] This was the approach of the first version of 'Exploring Meinong's Jungle'.

2. Item existence. Existence of objects is to be defined in terms of universal equivalence of predicate and sentence negation, thus

DEI. $xE' =_{Df} (f)x{\sim}f \equiv {\sim}xf$

so at least a sound upbringing in classical logical theory would fortify one in thinking. For consider again how negation scope differences in Russell's theory of descriptions (PM *14) disappear just when the object described exists.[1] But more careful reflection on Russell's theory leads to qualification of DE1; for scope continues to matter in intensional frames. A definition of E, like a definition of $\Diamond$, is only satisfactory if at least restricted to traits. Hence the mark 2 version:

E2. $xE =_{Df} (U \text{ ext } f).\ x{\sim}f \equiv {\sim}xf.$

Despite the attractive logical shape of this definition, it is tempting to complicate it modally in order to secure certain prized properties, notably the consistency connection and Meinong's theorem. The complicated form is this:

E3. $x\underset{\sim}{E} =_{Df} (U \text{ ext } f)\Box(x{\sim}f \supset {\sim}xf) \;\&\; \nabla T({\sim}xf \supset x{\sim}f)$,

where ∇T, i.e. 'contingently true', is defined: $\nabla TA =_{Df} \nabla A \;\&\; A$. It follows: $\vdash x\underset{\sim}{E} \rightarrow (U \text{ ext } f).\ x{\sim}f \equiv {\sim}xf$. Further, when an individual exists all its extensional features satisfy predicate LEM; $\vdash x\underset{\sim}{E} \rightarrow (U \text{ ext } f)(xf \vee x{\sim}f.)$ The definition of E (similarly of $\underset{\sim}{E}$) is a purely logical one; it makes no use of extralogical constants. In this respect at least the definition of object existence is comparable with Leibnitz's definition of object identity.

The rationale of the definitions of item existence is something like this: Items which exist are fully determinate in all extensional respects. This full determinacy can be explicated logically in terms of coincidence of sentence and predicate negation.[2] Put differently, entities are complete: for each trait, an entity definitely has the trait or else lacks it.[3] But only entities are really complete; one can always turn up aspects of nonentities in which they are incomplete. So for entities, and only for entities, predicate and sentence negation coincide. The arguments given in favour of the distinction between sentence and predicate negation help clinch this point: for they all turned upon consideration of features of nonentities. In the case of entities this distinction is not needed; hence its failure to put in an appearance in standard logic texts. The idea is, that is, that entities behave, at least in extensional frames, much as they do on Russell's logic, e.g. they are complete and determinate in all extensional respects. Classical logic has got things (more or less) right as regards the extensional logical behaviour of entities: it is with respect to incomplete nonentities and intensional phenomena that it is seriously incomplete. That neat picture, which is still quite prevalent,[1] has to go (as Wittgenstein 53 explained; see chapter 3): but for the present holding onto the picture will help.

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[1] In fact diametrically opposed sources converge on a definition like E1. Not only can results of PM be rewritten to yield such a connection. Results of Meinong point to the same connection (and, as it happens, first suggested the definition); for according to Meinong (cf. Findlay 63, pp.178-81) what marks out existing objects is their consistency and determinacy.

[2] Alternatively, full determinacy may be defined as neither indeterminacy nor overdeterminacy, that is x is fully determinate $=_{Df} {\sim}(P \text{ ext } f)(x$ is incomplete wrt $f) \;\&\; {\sim}(P \text{ ext } f)(x$ is inconsistent wrt $f)$. Hence, under E2, $\vdash xE \leftrightarrow x$ is fully determinate.

[3] It is this feature that is relied upon in courtroom cross-examination procedures where the objective often is to try to determine what is real (exists), what really happened, whether the witness is lying, etc.

In further support of the definition E2 consider first the unmodalised forms from which it derives. After these preliminary forms have been argued for the modal additions in the definition of $\underset{\sim}{E}$ will be examined. Consider in turn then, each entailment on which the revised definition of E' is based.

One half of the definition will follow (at least in a modal framework) if it can be established that

(a) $xE \mathrel{⥽} {\sim}(P\ \mathrm{ext}\ f)(xf \mathbin{\&} x{\sim}f)$ and

(b) $xE \mathrel{⥽} {\sim}(P\ \mathrm{ext}\ f)(xf \mathbin{\&} {\sim}x{\sim}f)$, i.e. ${\sim}\Diamond[xE \mathbin{\&} (P\ \mathrm{ext}\ f)(xf \mathbin{\&} {\sim}x{\sim}f)]$.

(a) follows from a requirement of adequacy on any definition of existence, that it should not be possible that an item exists which both has and lacks some extensional property; for otherwise impossibilia could exist.
(b) also looks desirable. If someone rejects the strict implication which (b) yields then he appears to be in the unfortunate position of asserting that it is possible of something which exists that it has a property though it is not the case that it lacks it. In the case of entities that can be empirically investigated it seems fairly clear that this is impossible.[2] For given such an entity it can, in principle be investigated whether the item has or lacks any specified feature of items of that sort; and investigation settles the matter, as an exhibitable item lacks a feature iff it is not true that it has it. There is no verifiable difference between an entity's lacking an extensional feature and the feature's not being true of it. The properties of having a property f and of not being the case that f is lacked have, that is, in the case of empirically investigatable items, all features in common; thus by an identity principle they coincide. But any entity can in principle be empirically investigated. The last claim is highly contentious. It rests either upon, what is rejected subsequently, empiricism, or upon the controversial thesis, defended subsequently, that nothing exists except particulars. Consider then particulars (if any universals exist they can be considered as a separate case). Any particular has some sort of spatio-temporal or temporal locatability. Thus if a particular exists it can in principle be located and investigated by some observer. But then it would be determinate or complete with respect to every feature, as it could in principle be examined with respect to every feature. By sentence LEM the entity would either have any given feature or else it would be the case that the entity did not have it. But if it did not have an investigable feature, then applying coincidence criteria as before, it would lack it. There would be no point in denying that it lacked the feature, because this would suggest that the entity was not investigable, that we lacked data on it. Moreover if the entity were not determinate with respect to each feature, for some feature it would be false that the entity possessed it and false that it lacked it. Then we could hardly locate the entity. Finally, consider an

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[1] It appears also in Parsons 78, yielding one of the fundamental respects in which Parsons' work differs from the present work (see further 8.7).

[2] If it is clear in all cases, well and good: the lucky reader can skip ahead.

arbitrary universal, if any, that exists. If it exists, then presumably it reflects particulars that exist.[1] But none of these particulars will be extensionally indeterminate, so if the universal genuinely reflects them, it will not be extensionally indeterminate.

Consider now the converse implication:

(c) ~xE ⥽. (P ext f)(x~f & xf) ∨ (P ext f)(~xf & ~x~f)

after transformation. First, if an item does not exist, then it depends for its characterisation, so both Meinong and Russell thought, upon description. For it cannot be suitably located and examined. But descriptions, even of mathematical items, are always incomplete. They do not, and cannot because of their finitude, specify how an item is with respect to the having and lacking of every property. Consider the lack of detail in descriptions of perfectly elastic balls in applied mathematics treatises. The colour of the balls, their ages and construction, are not specified; nor are these properties determinate with respect to the items. All mathematical possibilia are similarly limited. So even given a full description, for instance by specifying necessary and sufficient conditions, of a nonentity, the item will still not be determinate or complete with respect to all properties. Therefore sentence and predicate negation will not coincide for all predicates.

Secondly, if an item does not exist then either it is impossible or it is merely possible. If it is impossible this impossibility will be reflected in some of its properties; like Meinong's round square it will both have and lack some property. How else could the impossibility of the item emerge? More generally, any impossibilia will have some property f which violates predicate LNC, for which x~f and xf are both true. If an item is merely possible, this mere possibility will be shown too in its properties, in its under-determination with respect to the possession or lack of certain traits; like Kingfrance or a perfect gas there will be properties it neither has nor lacks. How else do we tell that possibilia don't exist? Not by search alone in most cases; for we don't, in fact can't, exhaustively search the universe or the complete decimal expansion of Π. If an item is merely possible actual search will not disclose it: we are forced back to the item's characterisation. Its characterisation will be such that, like Kingfrance, for some property f it violates sentence LEM, that is xf ∨ x~f is false. Certain arguments of the intuitionists against LEM can also be redeployed as arguments in favour of this point; for the items the intuitionists are concerned to exclude are - according to them also, because of their constructivity criterion for existence - mere possibilia.

The arguments for (b) and (c) are by no means conclusive (it is hard to find solid arguments in this area); and as will be seen later, they are faulty. Nor are they immune to counterconsiderations. A definition based directly on predicate LNC and LEM appears especially open to various counter-examples. For instance, might it not be feasible to characterise completely a nonentity? Such definitions as: the item which has features f^i (where i ranges over some indexing set) and lacks all other properties not hereby specified in its characterisation, may be suggested. But quite apart from the self-reference in the characterisation, a counter-example has not so far been provided - so it may be claimed. For it would need to be shown that the item in question does indeed have or lack all features; and this would require the Characterisation Principle in a case where it is not available (because of predicate quantification).

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[1] Though some such principle was adopted in most traditional theories of universals it assumes rather a lot, and has been rejected by recent platonism.

It remains to explain the modalisation in the definition of $\underset{\sim}{E}$. One implication in the definiens is increased to strict implication strength to guarantee that existence entails possibility, i.e. to ensure, what does result, $\vdash x\underset{\sim}{E} ⥽ x\Diamond$. The further modalisation in the definiens is designed to guarantee the thesis that no item necessarily exists. Meinong's theorem follows using the definition, namely $\vdash \sim(Px)\Box x\underset{\sim}{E}$. But without the further modalisation the definition would not automatically ensure this outcome of Independence Principle.

As well as $\vdash x\underset{\sim}{E} ⥽ x\Diamond$, $\vdash \Diamond x\underset{\sim}{E} ⥽ x\Diamond$, one half of the frequently assumed relation between item possibility and possible existence, is deducible. But the converse half, $x\Diamond ⥽ \Diamond x\underset{\sim}{E}$, is still not forthcoming, and should be rejected. Nor should it follow, as the example of nonexistence, already glimpsed, reveals. Other, but more controverisal, counterexamples to linkages of the form $x\Diamond ⥽ \Diamond xE$ are provided by such items as a null item, a null set, zero and infinity (on Aristotle's view), and also, rather differently, by pure incomplete objects. Consider, for instance the round squash: as a pure deductively (unclosed) object this is round and a squash and has no other properties. Thus it is incomplete, e.g. it is neither blue nor not blue. Hence it does not exist. Nor can it exist: to exist it would have to be completed, but any such completion is a different object. But such a pure object is possible.

The modalisation of E2 which led to E3 has its drawbacks as well as its advantages. One drawback is that 'exists' ceases to be in an obvious fashion, what it is under E2, an extensional predicate. This blocks for example, the derivation as from E2 of the result $\vdash x{\sim}E ⥽ {\sim}xE$.[1] A serious, connected, disadvantage is that the transparency of 'exists' can no longer be established; for replacements in model functors would be required. Under E2 however, it can be shown that $\vdash x = y \supset. xE \equiv yE$, as expected. This result appears more basic than the modal features E3 yield. Moreover, with the modal features one can be accused of trying to write substantial features, which should appear as axioms or consequences of axioms, into definitions.[2] There is a limit to how far the process of writing truths into definitions can be carried, it does not extend to contingent truths. It is an unquestionable fact that

E'. $(Px)xE$, i.e. some items exists -

a fact demonstrable by observation - but in any system whose structure is analytic (i.e. all axioms are logically true and rules preserve the property) no such contingent truths are derivable. However nothing prevents the addition of purely contingent postulates to a logic, and there is often good reason for introducing such postulates, e.g. in applied sciences. The addition of E' enables the derivation not only of its logical analogue

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[1] Even with E2 the expected relation ${\sim}xE ⥽ x{\sim}E$ does not follow. This connection can however be made (quite consistently) a definitional matter: upon defining $x{\sim}E =_{Df} {\sim}xE$. Hence, e.g. $\vdash \Box xE ⥽ {\sim}\Diamond x{\sim}E$.

[2] But then often definitions have at least something of this role: cf. the logical reduction of mathematics to logic for a most striking example.

E. $\Diamond(\text{P}x)x\text{E}$, i.e. it isn't impossible that some things exists,

but also using Meinong's theorem, both the pair $\vdash (\text{P}x)\nabla\text{T}x\text{E}$ and $\vdash (\text{P}x)\nabla x\text{E}$ and the stronger pair $\vdash \nabla\text{T}(\text{P}x)x\text{E}$ and $\vdash \nabla(\text{P}x)x\text{E}$ follow.

Principle E, though necessarily true (since true, and modal), does not follow just from the modally dressed up definition E3: E will however follow given suitable Characterisation Postulates. To sum up: it is beginning to appear that 'exists' should be extensionally defined, and the modal properties of existence located in some further principle (such as a Characterisation Principle). For this reason in particular, it seems best to resort to definition E2 of 'exists'.[1] Although this definition will generally be adopted in the (untensed) formal developments that follow, it is ultimately unsatisfactory (and not because it does not supply desired modal properties which can be supplied from elsewhere). Firstly, the argument that all entities are complete in all extensional respects was inconclusive: Secondly, there are counterexamples: such entities as hills, towns, forests may be indeterminate with respect to such features as their boundaries, exact size, etc. (see further chapter 3 ff.) The diagnosis of the problem (given in chapter 9) will be that the restriction in E2 to extensional properties is still insufficient, that a somewhat narrower class of properties still is required. So far the logical apparatus - which has been adapted after all largely from impoverished referential enterprises - is not rich enough to delineate the class in question.

The logic is rich enough, however, to reflect some of the earlier informal discussion of objects. For instance, one can define:

x is an impossibilium $=_{\text{Df}} \sim x\Diamond$

x is a (pure) possibilium $=_{\text{Df}} x\Diamond \,\&\, \sim x\text{E}$

x is an entity $=_{\text{Df}} x\text{E}$.

Hence $\vdash (\text{U}x)(x \text{ item} ⥽\!.\; x$ is an impossibilium $\vee$ x is a possibilium $\vee$ x is an entity); $\vdash \sim(\text{P}x)(x$ is an impossibilium & x is a possibilium); and so on.

§20. *Identity and distinctness, similarity and difference and functions.* The criteria for identity and similarity of nonentities are the same as those for entities, namely coincidence of appropriate classes of properties of the items.[2] As in the case of entities so in the case of other items, it is important to distinguish Leibnitz identity defined attribute-wise (in the presence of strict implication - as a poor stand-in for entailment)

$$x \approx y =_{\text{Df}} (\text{U}\psi)(x \text{ i } \psi \leftrightarrow y \text{ i } \psi),$$

from extensional identity (sometimes, a little inaccurately, called contingent identity) which is defined

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[1] Correspondingly to the unmodalised definition of $\Diamond$, if $x\text{E} ⥽ x\Diamond$ is to hold. Then such modal principles as $x\Diamond ⥽ \Box x\Diamond$ will have to be supplied by other than definitional resources.

[2] This account, which answers objections to nonexistent objects based on a lack of identity conditions, objections emanating from Quine's work, has recently been taken exception to by Lambert and Quine. Their new objections, which do not stand up, are considered in chapter 4.

$$x = y =_{Df} (U \text{ ext } \psi)(x \; i \; \psi \equiv y \; i \; \psi);$$

and each of these should be distinguished from strict identity, which is defined

$$x \equiv y =_{Df} \Box(x = y).$$[1]

Each one of these identity determinates is a full equivalence relation, i.e. unconditionally reflexive, symetrical and transitive. In contrast to Russell's theory then, identity of nonentities is unconditionally reflexive; $x = x$ irrespective of whether x exists or not. Pegasus, for instance, does not have, as it does in Russell's theory, the seemingly inconsistent feature of not being self-identical.

Without (proper) qualification of the class of transferring features in the definition of extensional identity, extensional identity would collapse into Leibnitz identity. Consider e.g. the identity I defined thus:

$$xIy =_{Df} (Uf)(xf \equiv yf).$$

Then, since $xIy \rightarrow . \; xg \leftrightarrow xg \equiv xg \leftrightarrow yg$, by abstraction or equivalently substitution, $xIy \equiv x \approx y$; thus also, as it turns out, Leibnitz identity may be defined in terms of material equivalence. What properly stops the invalid argument from "a and b *in fact* have the same properties" to "a and b *necessarily* have the same properties", is the qualification in the definition of the determinate = to extensional properties.

How the different identity determinates introduced are synthesized in the one theory of identity is through the theory of logical determinables (outlined in Slog, p.239, and explained in a preliminary way in the case of identity in IE, pp.124-5). Identity, like most key logical notions, is a determinable under which various determinates fall.

> ... such words as 'everything', 'some', 'same', 'possible', 'not' and 'implies' are *logical* determinables. In each case there is a common *covering* sense, and under this a class of distinct senses, the determinate senses. For example, the word 'everything' has as a covering sense that of the universality of the class of things (taken distributively) but the specification of the nature of the constraction class [roughly, of the domain of things] leads to distinct senses under the cover. In one such sense, that demanded by most classical logicians, "everything exists" is true, but in another it is false; thus *salva veritate* may be used to show that the senses under the cover are distinct ... (Slog, p.239).

With identity the determinable formula can be expressed thus: x is identical with (the same as) y iff, for every appropriate predicate[2] f, xf iff yf, where *every*, *appropriate* and *iff* are all open to determination, within bounds. A minimal form - from the two valued atemporal perspective - is provided by extensional identity.

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[1] It follows, what may be used as an alternative definition, $x \equiv y \leftrightarrow (U \text{ modal } f)(xf \equiv yf)$. Firstly, if $x \equiv y$ then x and y are interchangeable in all modal contexts. Conversely, since $\Box(\ldots = x)$ is modal, given $(U \text{ modal } f)(xf \equiv yf)$, it follows $\Box(x = y) \equiv \Box(y = x)$, so $x \equiv y$.

[2] Strictly: predicate qu(f). Alternatively, the right-hand side of the biconditional can be expressed: for every feature, x has the feature iff y does, where now *feature* is open to determination, determination which traits (in Quine's sense) bound below. For yet further, equivalent, formulations see EI, pp.924-5.

The important respect in which the identity determinates defined differ is in the substitutivity principles which they yield. As may be shown by an inductive argument, Leibniz identity permits intersubstitution of identicals in *all* (nonquotational) sentence frames; For this reason Leibniz identity is a rather useless *identity* determinate in more highly intensional logic, e.g. any logic which includes epistemic functors such as 'a believes that ...' or assertive functors such as 'b infers that ...': it imposes more stringent requirements for coincidence of features than most true identity claims meet (see §11 and also Routley and Macrae 66).[1] For the formalisation of everyday identity claims the working determinate - the main ordinary determinate - *is extensional identity*, for identity claims of mathematics and logic some variant on strict identity.

In contrast to Leibniz identity, strict identity only warrants intersubstitutivity in extensional and modal frames, and extensional identity just in extensional sentence frames. Because of these proper restrictions on substitution, identity puzzles like the modal paradoxes are easily resolved (as already explained in detail in §11). For instance, as (the evening star = the morning star) & ~(the evening star ≡ the morning star), substitution of 'the evening star' for 'the morning star' in strict sentence frames like '□ (the morning star = the morning star)' is not licensed and is evidently inadmissible. For if a and b are only extensionally identical, are one and the same as $\underline{\underline{T}}$, that gives no guarantee that they are $\underline{\underline{a}}$-identical . for another possible world $\underline{\underline{a}}$; yet that is what substitution in the scope of □ would require. Similar points meet Ryle's objection (in 72) to Meinong's theory, that Meinong is committed to denying the plain astronomical fact that the Morning Star is the same thing as Venus, that statements about the Morning Star, e.g. 'It is shining brightly', are about the planetary thing, Venus. For Meinong's theory is readily extended to include the theory of identity given, under which Venus is the *same* as the Morning Star, though the items are *strictly* different.

Questions like 'But what sort of identity can obtain between nonentities?', '... is the concept of identity simply inapplicable to unactualised possibles?' (Quine FLP, p.4) are often presented as if they presented major difficulties for a theory of items. They do not (see also chapter 3). Various sorts of identity relations may hold between possibilia; thus Hecuba's mother ≈ Hecuba's female parent; a perfect Euclidean triangle ≡ a perfect Euclidean trilateral; but Venus = Aphrodite. Possibilia may be simply extensionally identical and not strictly identical. Consider identities like: what I am now thinking about = a unicorn. The extensional identity holds because predicates like 'is horned', 'is mammalian' transfer; but the identity is not strict because it is quite contingent that I was thinking of a unicorn and in a different situation my thoughts may have been otherwise directed.[2] Thus in the case of nonentities, extensional identity does not vanish and cannot be replaced by strict identity. Indeed where 'a' and 'b' are (genuine!) proper names, identity of a and b can only be extensional identity (since such identity is rock-bottom identity), and never, it would seem, strict identity. For these reasons the attempt to replace nonentities by concepts of some sort is bound to fail, since the identity conditions for concepts are at least strict. Thus for nonentities there can be no satisfactory 'therapy of individual concepts' of the Church-Carnap kind.[1]

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[1] Leibnitz identity can however be assigned alternative useful roles - in nonquotational languages, where it comes close to specifying synonomy (see §24), and in language including quotation where it may serve to mark out type-identity of linguistic units.

[2] The semantics given for identity clarifies the point. Where x = y & ~(x ≡ y), x and y coincide only in world T, not in all possible worlds.

With nonentities, where affirmation of a negative feature differs from denial of a positive feature, distinctness must be distinguished from nonidentity; that is $x \neq y$, i.e. $x \sim= y$, distinguished from $\sim(x = y)$. Paralleling the three identity determinates, three distinctness determinates may be defined:

$$x \not\approx y =_{Df} (Pf).xf \;\&\; y{\sim}f;$$

$$x \neq y =_{Df} (P\ ext\ f).xf \;\&\; y{\sim}f;$$

$$x \not\equiv y =_{Df} \Box(x \neq y).$$

Thus $\vdash x \neq y \mathrel{-\!\!\!3} y \neq x$, etc. Existence is sufficient for distinction to merge with nonidentity, i.e. $\vdash xE \mathrel{-\!\!\!3}.\ x \neq y \equiv \sim(x = y)$.[2] In the case of nonentities $x = y$, however, it can be false that $x \neq y$ and also false that $x = y$. In such cases $x = y$ is determinate. The distinctions may be put to work in resolving puzzles concerning the incompleteness and overcompleteness of nonentities. Consider, for example, Noselfindo,[3] a (the) strictly non-self-identical man standing in doorway d, i.e. $(\xi x)(x \not\equiv x \;\&\; xd)$. By the reflexivity of strict identity,

(i) Noselfindo $\equiv$ Noselfindo.

Applying, however, a Characterisation Principle to the characterisation of Noselfindo,

(ii) Noselfindo $\not\equiv$ Noselfindo.

Hence (i) and (ii) are overdeterminate, and their negations (i) and (ii) are indeterminate: strict self-identity and non-self-identity are overdeterminate with respect to Noselfindo. Since $\vdash (Pf)$(f is $\sim$-overdeterminate w.r.t. a) $-$ $\sim a\Diamond$, it follows that Noselfindo is an impossibilium. What does not follow is that Noselfindo's features imply that strict identity is not reflexive. Nor can his mate Negselfindo, i.e. $(\xi)(\sim(x \equiv x) \;\&\; xd)$ refute the law of self-identity; for the Characterisation Principle does not have unrestricted validity (see §21), and does not extend in an unqualified way to sentence negated predicates.

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[1] The quotation is from Quine FLP, p.4; see also FLP p.153. Carnap's therapy is set out in MN pp.64-8 (and elsewhere): it is criticised in chapter 4, and also in §7 above.

[2] The converse principle, $(y)(x \neq y \equiv \sim(x = y)) \mathrel{-\!\!\!3} xE$, though a trifle tempting, appears to be false.

[3] R.M. Chisholm suggested the character Noselfindo and some of his mates as providing counterexamples to the principle of self-identity.

Transparency or referentialness of predicates may now be defined in the formal theory, using analogues of the definition already given (on pp.103-4). For example,

$$\text{ref } f^1 =_{Df} (x, y)(x = y \supset . \ xf^1 \equiv yf^1);$$

and analogously for two and more place predicates,[1] extensional identity preserves truth in all places. Hence $\vdash \text{ref}(=^1)$, where $x(=^1) =_{Df} x = x$; also $\vdash =\text{ref}$, i.e. $(x, y, z, w)(x = y \ \& \ z = w \supset . \ x = z \equiv . \ y = w)$. Further $\vdash \text{ref } E$. In fact referentialness follows at once from extensionality; $\vdash \text{ext } f \supset \text{ref } f$. Thus also predicates which are not referential are intensional. The converse connections do not hold. Some predicates which are referential are not extensional.

Familiar links between existence and identity follow: $\vdash xE \equiv (\exists y)(x \approx y)$; $\vdash xE \equiv (\exists y)(x = y)$, corresponding to a commonly used definition of E. Further $\vdash x\Diamond \leftrightarrow (\Sigma y)(x \equiv y)$ and $\vdash x \text{ item} \leftrightarrow (Py)(x \approx y)$; items are things that are identifiable by (particular) quantification.[2]

Basic notions from the theory of meaning may be approximated in terms of identity. For example, the designation and reference relations, des and ref may be defined:

$$x \ \underline{\text{des}} \ y =_{Df} x = y; \qquad x \ \underline{\text{ref}} \ y =_{Df} x = y \ \& \ yE.$$

The notions do duty respectively for qu(x) designates, or is about, y, and qu(x) refers to y, which cannot be defined until the quotation functor qu is introduced. Thus, for instance 'the author of Waverley' refers to Scott, and the description has the reference, Scott; 'Hephaistus' designates Vulcan, but does not refer to Vulcan.[3] Stronger identity determinates similarly enable the definitions of intensional meaning connexions, e.g. as noted, in quotation-free systems Leibnitz identity gives a very crude approximation to synonymy (see further §24).

Similarity determinates are defined in the same way as identity determinates, the sole difference being that the quantifier 'for every' is displaced by the quantifier 'for most' (for, very similar) or 'for many'. Similarly the determinable 'similar to' is encapulated by a recipe like that given for 'identical to', except that 'for many' again replaces 'for every'. As with identity, the contrast, and basic determinate is the extensional case, i.e. is extensional similarity. (Extensional) identity is the limit of (extensional) similarity, as the class of shared features increases: for what are very, very, very ... similar are (almost) identical. Just as distinctness was defined in contrast to identity, so nonsimilarity, or difference in one good sense, can be defined by contrast with similarity.

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[1] The predicate definitions can be linked with property definitions through the equivalence: λf ref iff f ref, etc.

[2] This gives part of what is (trivially) correct in the slippery dictum, No object wihtout identity, or matter farther discussed in chapters 3 and 4.

[3] Fuller definitions exposing qu take the following lines: qu(x) signifies $y =_{Df} x = y$; qu(x) refers to $y =_{Df} x = y \ \& \ yE$. Hence $\vdash$ qu(x) has a reference $\leftrightarrow (\exists y)(x = y)$, $\vdash$ qu(x) has a reference $\leftrightarrow xE$, etc. Then $x \ \underline{\text{ref}} \ y \leftrightarrow$ qu(x) refers to y, etc; i.e. ref and des absorb qu.

Given identity, a logical theory of functions can be designed. But it calls for some niceities that classical logic cannot express, because of its single implication and single identity. A function is a relation of two or more places satisfying certain identity conditions.[1] Evidently a function can vary according as the identity determinate in terms of which it is characterised. Thus functionality is also a determinable. The critical condition for a relation R being a function - also the key condition for the eliminability of functions - is as follows:

$(x_1,\ldots,x_n)(P!w)R(x_1,\ldots,x_n, w)$, i.e. for every $x_1,\ldots,x_n$, and for some unique w, $R(x_1\ldots x_n, w)$. And how is uniqueness defined? Thus: if $R(x_1,\ldots,x_n, w_1)$ and $R(x_1,\ldots,x_n, w_2)$ then w_1 is identical with w_2. The underlined terms indicate determinable functors. Let us fix the conditional. Even so what counts as a function depends on an identity determinate, and strictly in place of such functions as ϕ, ψ, etc., we should write ϕ_I, ψ_I, etc., the subscript indicating the identity determinate. Thus, for example, an extensional function $\phi_=$ represents a relation which is unique under extensional identity, $\psi_\equiv$ function of the sort common in modern logic under strict identity.

Nor is that where the matter ends. It is usually supposed (correctly under prevailing assumptions) that for any function ϕ, if x is identical with y then $\phi(x)$ is identical with $\phi(y)$. Suppose ϕ is $\phi_=$, so that all that is required for the second identity is extensional identity. As regards the first, the conditions given may still not be strong enough to yield the conclusion. For example, where the first determinate is extensional identity also, the consequent will not follow from the antecedent unless ϕ is extensional in the relevant place. Thus in a proper theory of functions information is required, and should be kept track of in one way or another, not merely as to the identity determinates involved (commonly fixed for a given investigation), but also of the degree of intensionality of the relations and functions.

§21. *The more substantive logic: Characterisation Postulates, and other special terms and axioms of logics of items.* The logic so far developed, though an appropriately neutral one, lacks distinctive theses of a fuller theory of objects, such as Meinong's, which ascribes extensional features to nonentities. Of course even an ontologically neutral logic is a substantial improvement on classical logic - for reasons already marshalled. The logic is, however, seriously incomplete. Though it requires, because of its two-valued sublogic, that it is either true or false that an item which is f (e.g. a round object, or object b) is f (e.g. is round), the logic does not enable us to determine whether it is true or is false, it does not help us settle which truth-value is taken. In particular, the logic does not yield even our initial truth-value assignments on which much of the early argument was based; it does not assign truth-value true to sentences like (1)-(4) [of part II, or analogues of these containing indefinite descriptions] and truth-value false to sentences like (5)-(6). Characterisation Postulates will close many of these gaps.

1. Settling truth-values: the extent of neutrality of a logic. It is a debatable matter how much a given logic should settle, to what extent it should delegate particular truth-values. A logic can decide a priori too

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[1] Functions treated intuitively as rules come to the same.

much. An inconsistent logic is usually thought to do this. But a consistent one may too. If it followed from the logic alone that mesons or mountains on the other side of the moon did not exist (or did exist) without special contingent data added to the logic, then the logic would overdetermine truth-values. Whether a logic does overdetermine truth-values, like whether it is correct, cannot always be assessed independently of philosophical presuppositions. But a logic may decide too little, by not even settling logical matters which are within its jurisdiction. Weak modal logics like Lewis's S2 have been criticised on this sort of ground, e.g. by Carnap (in Schilpp 63, p.63). When purely logical matters are not resolved the validity of arguments which depend on these points cannot be properly assessed. To that extent the logic fails in its task. But what counts as a purely logical matter is of course far from transparent.

A logic in settling even logical matters may assign truth-values, or give a recipe for determining truth-values, in a way far from philosophically neutral. Even a logic that is ontologically neutral may be far from metaphysically neutral. If the logic alone guarantees that something necessarily exists, and not merely that some existent exists, it incorporates metaphysical presuppositions. For instance, standard modalisations of classical quantification theory are justly criticised as metaphysical because they contain theses like $\Box(\exists x)(xf \vee \sim xf)$ which require for their intended interpretation that something necessarily exists. In return, the theory of existence developed here may be censured as insufficiently neutral because of its thesis that no item necessarily exists. Unremarkably, no (interpreted) logic is altogether free of philosophical presumptions; and in going on to try to settle the truth-values of sentences like (1)-(4) within the logic we are leaving more neutral territory.

A logic may not be intended to be philosophically impartial throughout; it may reflect in parts a particular philosophical bias; and it may just be the formalisation of a certain set of philosophical theses. Even such logics can be separated into more and less neutral segments, into pure and applied (or biassed) parts. Here results which depend on a characterisation postulate can be separated out as less central and less metaphysically neutral, much as results which depend just on classical quantification theory can be separated out as more neutral, because more readily reinterpretable in other ways, than results which depend on classical identity and description theory.

In classical logic there is a radical difference between entities and nonentities, differences particularly apparent in their treatment in description theory. Classically nonentities only get in at all by the back door, and then they have no independent logical role. For all statements apparently about them are reduced to statements about entities. The prejudice against nonentities is especially apparent in truth-value assignments. Where a is an entity classical logic decides only logical properties of a; thus the truth-value of atomic wff, such as af, are left open. But if a is a nonentity then all its properties are automatically decided. On the other hand in the ontologically neutral logic sketched so far the truth-value of atomic statements about nonentities is, like that for entities, left open. This theory and classical logic provide the two sides of the all-or-none principle. Logic should not treat nonentities just like entities or it will fail to reveal the important logical differences between them. Moreover atomic statements about nonentities are mostly not open to resolution by extra-logical means, such as empirical ones, in the way that atomic statements about entities are. This is one reason why nonentities are of much more logical interest than entities.

To resolve cases of truth-value indecision, in the ontologically neutral logic developed, in a Meinongian way, further postulates are required, which settle the truth-values at least of certain claims of the form $\tau x(xf \,\&\, xg)f$, e.g. "a round square is not round", as true. Now Meinong decided the truth-values of these sorts of claims in a way that is very tempting, and which many of us automatically adopt, and apply in arguments, especially in reductio arguments; namely, items do have the characteristics which they are truly described as having, and they do have the characteristics they are genuinely assumed to have. Thus an item if truly described as a round square is round, and a round square is also square because it is truly characterised as (a) square. The leading principle in this technique of settling truth-values can be formulated: assumed and *described items have the characteristics they* are assumed to have or are *(accurately) described as having*. If f is a characterising or defining feature or follows from a defining feature of a, then af is true. It is this Characterisation or Assumption Postulate which is responsible for many of the features of members of *Aussersein*. But it has proved a very tricky principle to control properly.

2. *Problems with an unrestricted Characterisation Postulate*. The central and most difficult part of a logic of items revolves around the bottom order Characterisation Postulate, the postulate which guarantees that the round square is round, that a golden mountain is golden, that Kingfrance is a king, and so on. For *an unrestricted Characterisation Postulate cannot be correct*; that is,

(UCP) $A(\tau xA)$, with τ some descriptor, is false without qualification.

For (1) in any nonvacuous logic some logical principles (usually distinct from UCP, but perhaps UCP itself) must be correct, say law L. Consider $\tau x \sim L$, where x is so chosen that it is not free in L. By (UCP), $\sim L$. Thus both L and $\sim L$ are correct; inconsistency results. Put differently, given UCP, whatever L, L is refuted.[1]

Two special cases are worth noticing:

(1a) Consider an item which is both round and such that it is not the case that it is round; symbolically, where κ reads 'a', $\kappa x(x\,rd \,\&\, {\sim}x\,rd)$. By UCP specialised to κ, $\kappa x(x\,rd \,\&\, {\sim}x\,rd)rd \,\&\, {\sim}\kappa x(x\,rd \,\&\, {\sim}x\,rd)rd$, directly contradicting a substitution instance of LNC. This is effectively the first of Russell's two criticisms of Meinong's theory in his review of TO (Russell 05, p.523; also OD, p.45).

(1b) Consider an item which, like Negselfindo, is not self identical, i.e. $\kappa x{\sim}(x = x)$. By UCP, ${\sim}[\kappa x{\sim}(x = x) = \kappa x{\sim}(x = x)]$, so contradicting a substitution instance of the reflexive law of extensional identity.

Because logical laws act as conditions they must, given simple consistency, exclude something, some presentations of some (impossible) worlds. But *any* exclusion could be violated using an unrestricted Characterising Postulate. Thus for a consistent logic, indeed for a nontrivial logic, the stark Characterisation Postulate, UCP, must be restricted - at least to some proper subclass of wff (A) and items (τxA) within the sense of the theory.

(2) The Characterisation Postulate enables us to decide the ontological status of any item that pleases us, as we please. Suppose, for example,

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[1] More generally, any logic which is closed under modus ponens (for some implication), as every decent logic is, is trivial if it includes UCP, see chapter 5.

someone wants a philosopher's stone which exists. Then consider such a philsopher's stone; by UCP this exists. In a similar way UCP sanctions ontological proofs of *all* sorts. Sometimes this is harmless, as with a possible golden mountain, but sometimes it is disastrous, and sometimes it leads to unwanted contradictions, as in the case of an existent round square. This is Russell's second criticism of Meinong's theory of objects (see 05; also Findlay 63, pp.104-6). An unqualified CP thus disastrously overdetermines truth-values, and in particular ontological status. For, in any case, *assumptions* do not, and *should not settle the ontological or modal status of assumed items*: existence and possibility of items are consequential properties of items, properties which are consequential on defining features of items, but not themselves characterising features of items. To suppose that existence and possibility are characterising features would both violate the independence principle, and run head-first into the arguments in support of the thesis that existence is not a characterising property.

The only viable course open is the expected and intuitive course: to restrict the Charactarisation Postulate. For the alternatives of sacrificing all other logical laws, and of admitting without control ontological proofs, are indefensible. Moreover

(3) the unrestricted Characterisation Postulate is self-refuting. For consider $\tau y{\sim}A(\tau xA)$, where y is not free in A. By UCP, $\sim A(\tau xA)$, refuting $A(\tau xA)$.

The assumption that the Characterisation Postulate cannot be duly restricted, which is very frequently used in arguing against any theory of objects, especially any theory of impossible objects, but even against theory of merely possible objects, has two main sources. Firstly, the assumption is (as explained in p.48) a hangover of the Reference Theory, so it is unremarkable that most opponents of nonexistent items are ineluctably tempted by it. For it is assumed, given the Reference Theory, that all objects exist in some way, but what exists in fully assumptible, so all objects must satisfy an unrestricted CP. Secondly, the unrestricted CP has been confused with a freedom of assumption principle, that one can assume anything, contemplate any object at all. The Freedom of Assumption Principle is unrestricted; so, it has been invalidly inferred, must the CP be likewise unrestricted. The argument is invalid because an item may not have all the features in terms of which it is contemplated. (The differences between the Postulate and the Principle are considered in detail in 6.4.)

There is a certain obligation on any *theory* of objects however to make some distinction (preferably a viable one) between items which are assumptible - more satisfactorily whose descriptions are reliable - and those which are not. Nor can a theory of objects indefinitely escape the million dollar questions: How can the CP be (properly) restricted? Under what conditions is it correct? But the questions can be briefly postponed, and an indirect approach is definitely better.

3. *A detour: interim ways of getting by without restrictions.*[1] Let us call items which lead via the Characterisation Postulate to inconsistency 'ill-behaved items'. Well-behaved or fully logical items are defined thus:

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[1] Some of these sections, which in hindsight may appear as detours and false leads, reflect my gradual and haphazard workings towards progressively more satisfactory forms of the Characterisation Postulates.

$$(\tau x A(x))\ \mathrm{log} =_{Df} \sim(Pq).\ \Box A(\tau x A(x)) ⥽ q \ \& \sim q,$$

where $A(x)$ is a wff which contains x free. Are ill-behaved items to be exempted from certain laws, or do they like fully logical items conform? It is hardly satisfactory to exempt ill-behaved items; and it is very tempting to insist on the universal validity of certain laws, that certain logical laws hold for all items, not just logical ones; for instance self-identity, $A ⥽ A$, and sentence LNC $\sim(A \ \& \sim A)$. Even logically ill-behaved items are self-identical, and even of ill-behaved items it is not both the case and not the case that they have given properties. In fact we have presupposed this in the logic, and have already defined *item* accordingly. Thus the Characterisation Postulate should be restricted at least to items which do not disturb the neutral logic (or its consistency), to logical items. And the desired restriction is of course deducible. For it follows that the Characterisation Postualte holds provided $\tau x A(x)$ is a fully logical item, i.e.

IA. $(\tau x A(x))\mathrm{log} ⥽ \Box A(\tau x A(x))$.

For $(\tau x A(x))\mathrm{log} ⥽.\ (p)\Diamond(\Box A(\tau x A(x)) \ \& \sim(p \ \& \sim p))$

$⥽.\ (p)\Diamond\Box A(\tau x A(x))$

$⥽.\ \Box A(\tau x A(x))$.

Hence of course $\vdash (\tau x A(x))\mathrm{log} ⥽ A(\tau x A(x))$. It follows $\vdash \sim(\tau x)\sim(x = x))\mathrm{log}$; $\vdash (f)\sim(\tau x(xf \ \& \sim xf))\mathrm{log}$. These examples show that IA does not suffer from those defects, listed under heading (1), that afflict the unrestricted CP. However, despite the logical demonstration of IA, it might be thought that the restriction to logical items is not sufficient, that objection (2) to a full Characterisation Postulate is not completely alleviated by a restriction to logical items. Consider, to meet one objection, an existent round non-round, i.e. $\xi x(xE \ \& \ xrd \ \& \ x{\sim}rd)$. But $\vdash \sim\xi x(xE \ \& \ xrd \ \& \ x{\sim}rd)\mathrm{log}$. For suppose an existent round non-round is a logical item. Then by IA and simplification, $\Box\xi x(xE \ \& \ xrd \ \& \ x{\sim}rd)E$, i.e. it necessarily exists. But since, by Meinong's theorem, no item necessarily exists, this item does not necessarily exist. The desired theorem then follows by sentential logic. Generally, $\vdash (f)\sim\tau x(xE \ \& \ xf)\mathrm{log}$. Thus an existent God and the most perfect entity are not fully logical items, and simple ontological proofs are destroyed. Nor do items which can consistently exist, but do not, raise a problem. For IA does not provide any means of strengthening possibility assertions to existence ones. Consideration of objection (2) does, however, suggest that fully logical items should be restricted to those that do not attempt to state their *own* ontological status - as does the possible perfectly elastic ball. A ban on the occurrence of ontic predicates in the characterisation A of (purely) logical item $\tau x A$ would have a good rationale. But there does not seem to be any *prima facie* objection to supposing that descriptions of items can correctly state the ontological status of the items in question, provided that the descriptions are not defining or characterising descriptions. That indicates the direction of travel.

The converse, $\vdash \Box A(\tau x A(x)) ⥽ (\tau x A(x))\mathrm{log}$, of IA is simply derived:

$\sim(\tau x A(x))\mathrm{log} ⥽ (Pp)(\Box A(\tau x A(x)) ⥽ p \ \& \sim p)$

$⥽.\ \Box A(\tau x A(x)) ⥽ (Pp)(p \ \& \sim p)$, changing p if necessary so that p is not free in A.

$⥽.\ \sim(Pp)(p \ \& \sim p) ⥽. \sim\Box A(\tau x A(x))$

$⥽.\ \sim\Box A(\tau x A(x))$. Hence

AP. $(\tau x A(x))\mathrm{log} \leftrightarrow \Box A(\tau x A(x))$.

But without sufficient conditions for an item's logicality IA and AP are rather worthless - unless modelling techniques are introduced. Otherwise it can never be employed in this way:- If for some model of the system $(\tau x A(x))\mathrm{log}$ is true and all previously made assumptions of logicality are true, then adopt $(\tau x A(x))\mathrm{log}$ as a thesis. But such a technique is unsatisfactory: it requires semantical development for the further formalisation of the theory; without a decision procedure it is quite non-effective; and it is likely to have a damaging effect on the class of models remaining. The unsatisfactoriness of an analogous (often proposed) procedure in the face of set-theoretic paradoxes, namely keep the Abstraction Axiom provided it does not lead to inconsistency, are well-known. For subsequent developments it seems best then to bypass the notion of full item logicality (because its modalisation creates difficulties in CPs, such as ECP below) and to operate instead with a notion of item reliability which is directly linked with the UCP and to see how the circularity in its use can be removed.

4. Presentational reliability. Reliability, or more explicitly presentational reliability, is defined as follows, with respect to singular descriptor τ: $(\tau x A(x))\mathrm{ass} =_{Df} A(\tau x A(x))$. Then $\vdash (\tau x A(x))\mathrm{ass} \equiv.\ {\sim}(Pq)(A(\tau x A(x)) \supset.\ q \;\&\; {\sim}q)$. What is now called (presentational) reliability used to be called, and is still called at some places in the text (e.g. p.48), assumptibility: hence the abbreviation to ass. But the older terminology is misleading: it suggests, what is wrong, that the notion corresponds to objects that can be assumed. On the contrary, however, any object can be assumed: by no means all of them are reliable in the way they present themselves (as $\tau x A$) as to how they are (whether they are indeed A). Failure to nail down the fundamental distinction between what can be assumed and what reliably has the features it presents itself (when assumed) as having, was a major source of trouble in Meinong's later theory (on the distinction see 6.4, and on Meinong's difficulties see 12.3). Use of the term 'assumptibility' tends to smudge that distinction.

Before sufficient conditions for item reliability are introduced, there are several observations to be made. Firstly, all the main logical systems so far developed are consistent. In the case of system 2Q, proof of simple consistency is (as observed) a mere neutral rewrite of standard proofs of consistency for second-order logic, e.g. that given in Church 56, pp.306-7. In case the starting system uses ξ in place of, or as well as, quantifiers, the proof is like the proof Church gives except that the logic is transformed into a protothetic formed by using the ξ-symbol in place of quantifiers. Other systems are, for the most part, proved consistent by being mapped back into one of these starting systems, by mappings like the following: predicate negation is mapped into sentence negation, sentence functors such as $\Box$ are mapped into an identity functor (which disappears), ⥽ is mapped into $\supset$, etc. That consistency can be established for such neutral logics is important: for many are they who have claimed, or else suspected, that even this much in the way of concessions to theories of objects is bound to result in formal inconsistency, that even going thus far in the direction of Gegenstandstheorie is going too far. Not so. Once, however, sufficient conditions for item reliability are adjoined elementary consistency proofs like these indicated mostly fail, and obtaining a consistency (or nontriviality) proof may become a complex task (it is not always).

Secondly, offsetting the consistency problem, it is possible to work in the logical theory at least with reliability as an hypothesis, but not asserted or even where it would certainly fail (compare the proposal in PM that the axiom of infinity be adopted as a working hypothesis).[1] Then the full logic developed, including the theory of definite descriptions of §22, is demonstrably consistent, except insofar as item defensibility hypotheses are converted into postulates.

Thirdly, item reliability assumptions are like item existence assumptions in modern platonistic theories. In fact, where the descriptor involved is ξ, the reliability assumptions are equivalent to particularity assumptions (since $(Px)A \dashv A(\xi xA)$), so the parallel is exact, particularity precisely replacing existence on neutral rendition. It is salutory to notice what is expected and what is offered regarding existence assumptions in a platonistic theory, such as Zermelo-Frankel set theory and its elaborations. A single decisive axiom for set existence is not expected, and not offered. Rather various axiomatic conditions are adopted, and many more are considered and some of them sometimes adopted. Nobody expects anything in any way approaching a complete enumeration of existence postulates for sets (as distinct from the sets of some conventionally distinguished basic theory). As it is with set existence axioms in platonistic set theory, so it is, in some measure, with item reliability axioms.

Sufficient conditions for item reliability are, by the nature of things, somewhat piecemeal. For (so it will be argued) different sorts of things typically have their own distinctive sorts of logics. These logical differences appear not in the common carrier logic which all objects satisfy, but in the substantive postulates for objects of each sort, and so in particular in Characterisation Postulates. For example, what conditions are sufficient for abstract items will depend on the sort of items in question. Thus one set of conditions are correct for ZF (Zermelo-Fraenkal) sets, another set for NF (New Foundation) sets. There is no reason why we should not hang onto a general logical frame in which both ZF and NF set theories can be developed; and there are good reasons for doing so. In particular, it would be pleasant to provide a general theory of mathematical items, including ZF items, NF items, and other set theoretic items such as the Russell class.

There are, firstly, important differences, in Characterisation Principles, between bottom order objects and higher order objects, between particulars and abstractions. Secondly, there are significant differences between various sorts of abstract objects, between sets, propositions, attributes, and the galaxy of objects of modern mathematics. The question of Characterisation Principles for higher order objects can be conveniently set aside: it is taken up again in chapter 5.[2] Thirdly there are differences in CPs for bottom order objects. Thus it makes a noticeable difference whether an object exists or not. This is reflected in an initial and obvious Characterisation Postulate (derivable in an augmented theory), that for existing items,

ECP. $(\xi xA(x))E \dashv A(\xi xA(x))$.

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[1] Various of the familiar objections to this can be avoided by are of a good implication, as introduced in §23; see the discussion in 11.1.

[2] The principles are centred on, and perhaps exhausted by, Abstraction Axioms.

5. Characterisation Postulates for bottom order objects; and the extent and variety of such objects. The first postulate ECP, that existence is sufficient for reliability, should not need much argument, since it is classically enjoined. Furthermore it is not going to lead to logical trouble by any of the familiar routes. For if an item exists then it must have consistent characterising features and so avoid objection (1) to UCP, and as it already exists an ontological proof cannot be worked on it to yield an objection of sort (2). The conditions are formulated only for ξ descriptions, though parallel conditions for definite descriptions are derivable (or else assumed).

A move no doubt seductive to rationalists is to widen the antecedent of ECP to possible items, to concede $(\xi xA(x))\lozenge \to A(\xi xA(x))$. But such a postulate would reopen the way for ontological proofs. An existent golden mountain (the existent perfect being) is a possibilium; but were it a reliable item, then an existent golden mountain would exist, and since an existent golden mountain is a sort of golden mountain a golden mountain would exist. A qualified form of the principle

$\lozenge$CP. $A(x) \circ {\sim}xE \,-.\; \xi xA(x)\lozenge - A(\xi xA(x))$,

qualified by a consistency proviso, that A(x) is consistent with x's non-existence, appears to avoid these kinds of objections. In the case of $\lozenge$CP the qualified reliability claim holds not just contingently, as with ECP, (since nothing necessarily exists), but necessarily. For $\vdash A(x) \circ {\sim}xE \to. \; (\xi xA(x))\lozenge \to \Box A(\xi xA(x))$. Conditions like $\lozenge$CP are difficult to use because it is often difficult to establish consistency provisions. Nor is it quite obvious that the provisions are adequate. So $\lozenge$CP, unlike ECP, is not here adopted.

Much more workable conditions which are close to the original intention and the intuitive instances of CPs take the following form:

FCP. $\Box A(\xi xA(x))$,

where A(x) is a wff (containing just x free) constructed in an allowable way from characterising predicates.[1] Consistency is maintained (or triviality avoided) by limiting allowable constructions to those for which models can be found in which A(x) is satisfied. For axiomatically ungoverned sets of characterising predicates this will always be the case.

Given that simple descriptive predicates such as '(is) round', 'square', 'golden', '(is) a mountain' are - as they will be taken to be - characterising and that conjunction and predicate negation are among allowable construction methods, logical renditions of (some) earlier preanalytic examples are readily derivable. Consider, e.g. a round non-round, represented $\xi x(xr \;\&\; x{\sim}r)$, b for short. Then, by FCP, $\Box(br \;\&\; b{\sim}r)$, whence $\Box(\xi x(xr \;\&\; x{\sim}r))r$ and likewise $\Box b{\sim}r$. Hence too $\vdash \Box{\sim}b\lozenge$; $\vdash \Box(Px){\sim}x\lozenge$; $\vdash (Px)\Box x{\sim}\lozenge$; $\vdash (Px){\sim}xE$; $\vdash \Box(Px)x{\sim}E$.

As there are various options for Abstraction Schemes to adjoin to 2QC, so there are various options for what is allowable in FPC. A representative restriction is that (from the 1969 theory) is that A(x) contain only bound subject variables and predicate connectives (where predicate conjunction, &, is defined wrt arbitrary term t: $t(f \;\&\; g) =_{Df} tf \;\&\; tg$).[2] A weaker restriction already adopted, is that A(x) contain only conjunction and predicate negation. What is not allowable - apart from sentence negation - is higher-order quantification, predicate or sentential quantification, or predicates defined in terms of such quantification, notably ontic and modal predicates such as E and $\Diamond$, logical predicates such as $\approx$ and =, and theoretical predicates such as 'determinate' and 'complete'.

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[1] The necessitated formulation is inessential; for the necessitated form would follow from an unnecessitated form by rule necessitation.

[2] (Footnote on next page).

Thereby excluded (and excluded as characterising predicates) appear to be all the predicates that would enable the violation of logical laws. This is not merely an ad hoc measure to preserve the consistency. For such predicates are (in a good sense) consequential, i.e. depend for their determination on the prior determination of lower order ones. Hence if we allowed a description to determine such predicates, we could obtain by description determination of predicates which might already be otherwise determined. Thus we obtain inconsistency. For example, consider 'the existing golden mountain', 'the possible round square', 'the item such that its being red logically entails its being two feet long'. Such features as those so presented cannot be determined by mere description, because they hold only as a result or consequence of the items' possessing certain other appropriate properties and not possessing others. But since the descriptions fail to guarantee these other properties hold (and even permit the conjunction, as in the above examples, of first-order properties which would result in the non-possession of the higher-order property in question), description alone can not determine such features. The limits imposed then are intended to exclude double determination, in particular determination by description or characterisation of what is already or independently (and perhaps differently) determined (e.g. by how the world is, by other characterisation). The limits help explain two other important matters as well: Firstly, how consistency (or in paraconsistent theories nontriviality) is ensured, namely by use of predicates which have, for the item or items in question, no other restrictions imposed upon them (cf. chapter 5); and secondly, the point of reduced relations (to be explained in the next subsection), namely that those are subject to no violable constraints.

CPC is insufficiently strong, however allowable is defined within the bounds marked out. It does not enable definitely described items to have their ascriptions. The reason is that the further clause defining definite descriptions in terms of indefinite descriptions will typically involve, through an identity or distinctness clause, predicate quantification, and so prevent it being proved that the golden mountain is golden. There are several ways around this obstacle, and some classification is worthwhile because there are different routes meriting investigation.

F Routes: Stay essentially within the confines of FCP, e.g. by admitting = (now as an undefined primitive into FCP),[1] or much better, by formulating FCP

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[2] (Footnote from previous page)

In the paraconsistent theory (of §23 ff.) an interesting restriction to contemplate is that A(x) be first-order (and of course include only characterising predicates), i.e. the restriction is a predicative one.

The definitional equation of predicate conjunction with sentential conjunction is not uncontroversial, and Parsons suggests (in 78) that it fails wrt dream objects. Nothing that follows really hangs the definitional equation: if need be it can be painlessly abandoned.

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[1] A disastrous course: identity is an exemplary noncharacterising predicate.

for descriptors other than ξ. Part of the difficulty could be avoided by extending FCP to apply directly to ι descriptions. But that, unless qualified, would lead to such erroneous results as that the golden mountain is unique among objects that are golden and mountainous (it is unique among objects that are just golden and mountainous). The trouble is easily avoided: adopt not (the not entirely expected) $A!(\iota xA)$, i.e. the x which satisfies A satisfies A uniquely, but simply

FCP. $A(\iota xA(x))$ with $A(x)$ as before.

Call this form of FCP, as distinct from the earlier ξ-form, the ι-form. Given a suitable theory of definite descriptions, of the type eventually arrived at in §22, the ι-form can be deduced from the ξ-form using the theorem: $A(\xi xB) \supset A(\iota xB)$. Thus the ι-form, which is accepted, can be obtained free.

G Routes: Genuinely enlarge FCP to the following:[1]

*GCP. $B(\xi xA(x))$,

where $B(x)$ is as in FCP, and $B(x)$ is deducible from $A(x)$. (Here, even more than elsewhere, a tight account of deducibility in terms of entailment will give better results than a strict account.) As for the ι-form, from *GCP it will follow (given the theory of §22) that the golden mountain is golden and is a mountain, but not that it is unique, except among items that are only golden and mountainous. Similarly all the other preanalytic working examples now follow.

There is another real point in perservering with a principle like *GCP: to take account of partial reliability. The description, $\xi x(xE \ \& \ xr \ \& \ xs)$ while not completely reliable, is at least reliable in part, as to roundness and squareness. But there is no way to use this information, no way so far to show for instance $\xi x(xE \ \& \ xr \ \& \ xs)s$. *GCP solves this problem.[2] There are however two serious hitches to *GCP.

Firstly, while FCP has a simple formulation without descriptors, as the particularisation principle

FCP'. $(Px)A(x)$, where $A(x)$ is as in FCP,[3]

an ξ-free formulation of the stronger *GPC is not so readily obtained. Yet such is desirable, for ξ theory is controversial enough in modal settings and becomes problematic where relevant connections are sought (see §23; also PLO p.223).

The second is more serious. *GCP is not sound, under the sort of restrictive interpretations that guarantee FCP. So long as something satisfies

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[1] As suggested in the 1969 formulation of the theory.

[2] It does not do quite enough. For it does not distinguish the round square from the existing round square. Indeed given just *GCP they are extensionally identical!

[3] Such particularisation theorems were called in an earlier version of this essay 'population theorems' - a piece of terminology probably best avoided. Particularisation theorems imply that domains are never null, but mostly are large.

A all is in order: but then $A(\xi xA)$, so the principle gives no new information. Suppose however nothing satisfies A, e.g. A is (paraconsistency aside) of the form $C \mathbin{\&} {\sim}C$. Then ξxA may be selected arbitrarily from the domain, and so may well not satisfy B. There is no obvious or easy repair, either by varying the interpretation of ξ or by restricting A; but a principle to replace the rejected *GCP will be adduced in 8 below.

Part of the intent of *GCP was to say that given any specification some object, "suitably" arbitrary, has the characterising predicates of that specification. Thus, for some object x, for any characterising predicate f, if A determines f then xfs, i.e. in symbols of 2Q+,

$(Px)(chf)(A(f) \supset xf)$,

where the (primitive) predicate ch of predicates distinguishes characterising predicates. In 2Q† then, where f is a one-place predicate ch(f) is a wff. As for other cases, ch(f) is often contracted to chf. The converse relation also appears correct for a *certain* object, not an arbitrary one, namely that given by exactly those characterisating predicates determined by A. That is, for any specification B of features of objects, there is some object x which has just the characterising features determined by B, i.e. for every f for which ch(f), $xf \equiv A(f)$.

To arrive at the same principle a little differently. Previously we had been looking at descriptions of objects, and asking what features an object so described has? The answers had as corollaries that there are objects of such and such sorts, as in FCP'. But we can simply ask: What bottom order objects are there (neutral 'are' naturally)? The answer sought takes not the correct form 'Every thing ...', but the form (Px)D. The familiar, and evident, assumption - that any characterisation, in terms of a set of characterising predicates, determines (exactly) an object - gives a basic answer. That is, for any specification or collection of predicates there is some object which has exactly the characterising predicates of that specification. The collection principle may be formulated thus:

$(P\alpha)(f)(f\epsilon\alpha \equiv A(f))$, with α a collection of predicates.[1]

Now according to the following abstraction scheme any statemental condition on predicates can be equivalently expressed through a set, i.e.

$(P\alpha)(f)(f\epsilon\alpha \equiv A(f))$, with α not free in A.

The converse connection also holds, since trivially there is a statement condition for every set, namely that of belonging to the set. Hence the collection principle is tantamount to the specification principle already formulated, namely

HCP. $(Px)(chf)(xf \equiv A)$, with x not free in A.

That is, *for any statemental condition* (in Wood's terms, any sayso) on predicates, *some item satisfies exactly those characterising predicates which conform to the condition*. This H principle exactly mirrors an abstraction scheme. For simply rewrite HCP permuting x and f; the result is

$(Pf)(chx)(fx \equiv A)$, with f not free in A, a predicate abstraction scheme, for some restricted class ch of objects.[1] The need for the provision on HCP is also like that on the second-order abstraction scheme. For if x were admitted free, then HCP would yield an x_1 such that for every characterising predicate f, $x_1f \equiv {\sim}xf_1$. That is, without the qualification, inconsistency is immediate.

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[1] The scheme goes back, in principle, to Meinong, who 'assumed that, for every subset of properties, there is in the realm of Aussersein precisely one object' (Grossmann, MNG, p.167). Strictly, Meinong excluded some properties such as existence from the admissible class. He assumed of course that the object had the properties determining it.

The marked resemblance of HCP to the predicate abstraction axiom already adopted (and to the derivative set scheme) - namely, for any statemental condition some predicate has exactly those instances which conform to the condition - provides a good ground for accounting HCP an abstraction scheme, for objects. Accounting it such enables the extension of a thesis argued in chapter 5, that all Characterisation Postulates (for abstract objects) are abstraction schemes.

For, what is more (but not too surprisingly given the route to HCPO), the H principle enables the derivation of the weakly restricted CPs previously accepted, i.e. in effect of FCP. Let C be any wff satisfying the weak restriction, i.e. any conjunction xf_1 &...& xf_n where $f_1,\ldots,f_n$ are either ch predicates or the predicate negations of ch predicates, which presumably are (as it turns out) also ch predicates. To derive FCP as restricted it suffices to show (Px)C. Apply HCP with A as the disjunction $f \approx f_1 \vee \ldots \vee f \approx f_n$ (in fact coincidence or necessary coincidence would serve as well). Then $(Px)(f)(ch(f) \supset. xf \equiv. f \approx f_1 \vee \ldots \vee f \approx f_n)$. Hence instantiating and distributing P, since $ch(f_1),\ldots,ch(f_n)$,

$$(Px).(xf_1 \equiv. f_1 \approx f_1 \vee \ldots \vee f_1 \approx f_n) \;\&\ldots\&\; (xf_n \equiv. f_n \approx f_1 \vee \ldots \vee f_n \approx f_n);$$

whence $(Px)(xf_1 \;\&\ldots\&\; xf_n)$, i.e. (Px)C.

Adoption of HCP absolves us (for the time being at least) from the problem of explaining allowable constructions, but it does not release us from the task of characterising characterising predicates. The predicate ch, is like the predicate ext, fundamental to the theory of items; but, unlike ext, the distinction it makes has not been sufficiently elucidated.

6. Characterising, constitutive, or nuclear predicates. Thus far the elaboration of the theory of items has relied on an intuitive and rather natural distinction between "characterising" predicates such as 'is round' and 'is golden' and predicates which are "not characterising" such as 'exists', 'is possible' and 'is complete'. Problematic cases, such as those provided by relational predicates (as, for example, 'married Joan of Arc') have been avoided (as is an author's privilege). But since the Characterisation Postulates, which are central to the theory of items, depend upon the distinction of one-place predicates, into characterising and not, it is important, especially for philosophical applications, and for assessment and criticism of the theory, to elaborate the distinction and to try to make it good. That does not imply obtaining necessary and/or sufficient conditions, though such conditions are desirable, and can (within limits, as will be seen) be had. A rough nonexhaustive typology of predicates will suffice for present purposes.[2]

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[1] The connections suggest two things: firstly, an (uninvestigated) n-place form of HCP, namely HCP^n. $(Px_1,\ldots,x_n)((chf^n)(x_1,\ldots,x_n)f^n \equiv A)$, with $x_1,\ldots,x_n$ not free in A; and secondly, an interesting way of restricting higher order abstraction schemes for consistent theories, that to non-paradoxical subjects?

[2] Rarely in the history of philosophy is much more, or even as much, offered by way of explanation of basic distinctions. Outstanding cases can be decided, as ch or not, as they arise and as the theory develops (cf. what happens in 7.7).

1.21 DESCRIPTIVE PREDICATES ARE CHARACTERISING

The distinction to be drawn is not exactly a new one but is similar to distinctions that run through the history of philosophy; for example, the traditional distinction between essence-specifying predicates and those that cannot be used in specifying the essence or nature of a thing; Frege's distinction of levels according to which 'exists', unlike 'is red', is a second-level predicate; Meinong's and Mally's distinction between konstitutorisch and ausserkonstitutorisch predicates which ties with Meinong's division of predicates (or rather properties) into orders; Russell's distinction of predicates (adopted in PM) into elementary and not, and the modern distinction of predicates into those that yield properties and those that do not. All these divisions make the distinction, from which a start can be made, between such predicates as 'is round', 'heavy', 'dry', 'cold', 'wet', 'red', on the one side and 'exists' on the other. The Mally-Meinong distinction - rendered by Findlay (63, p.176) as a distinction between nuclear and extranuclear cases - is especially germane.[1] Meinong applied the distinction to dispose of such 'Megarian subtleties' (as Findlay calls them) as that of the object d which is a specific shape of red which is simple (thus $d \approx \iota x(xr \;\&\; xs)$. If both predicates 'red' and 'simple' were characterising then dr & ds, i.e. d is complex contradicting the simplicity of d. The resolution is simply that 'is simple' is extranuclear: the simplicity of the shade of red is not a constitutive part of its nature, but is a property of "higher order" founded on the character of the object. Similarly Meinong points out (Mög, p.176) that 'is determinate' and 'is indeterminate' are extranuclear; so also are such other theoretical predicates as 'is complete'.

Paradigmatic characterising predicates are simple descriptive predicates; paradigmatic noncharacterising predicates are ontic predicates. These classes can serve as base cases in an quasi-inductive elaboration of the distinction to be drawn.

Ch(1) Descriptive predicates. Included are all, or almost all, those predicates that are cited as descriptive in ethics texts, which contrast descriptive with evaluative predicates. They are the familiar, ordinary predicates that would unobjectionably be used in describing or classifying a thing, or in older terms giving its essence or specifying its nature. They are the predicates that would enter unquestioned into taxonomic descriptions of species. Syntactically these predicates are of the following sorts:

(a) parts of an auxiliary verb, especially to be, concatenated with a descriptive adjective (predicative adjectives), e.g. 'is' + 'dry', 'dusty', etc. Parts of other auxiliary verbs may also be used (though such examples are not paradigmatic), e.g. of to become, as in 'become fat'. (Nonentities may change over time: they are not all nontemporal).

(b) parts of an auxiliary verb concatenated with an indefinite description of a descriptive kind, e.g. 'is a triangle', 'horse', 'house' etc. This group broadens to include 'is an old man', 'is a golden mountain' etc.

(c) intransitive verbs, descriptive of actions, states, etc.; e.g. 'runs', 'sits', 'sleeps', ... This group broadens to include verbs modified or qualified descriptively, e.g. 'runs slowly' (whether descriptive of the occasion or of a disposition), as contrasted with 'sleeps unintentionally'.

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[1] An elaboration of this distinction is fundamental in Parsons' theory of nonexistent objects (see 74 and 78). Though the characterising/non-characterising predicate distinction roughly coincides with Parsons' nuclear/extranuclear distinction for one-place English predicates, it diverges importantly as regards relational predicates, e.g. not every "plugging up" of a "nuclear relation" yields a characterising feature.

(d) predicate negations of the predicates of the foregoing classes.

Less clearcut than Ch(1), but suggested by (d), and to some extent guaranteed by CPs, are

Ch(2) Compounds of ch predicates. Predicate conjunctions, for example, of ch predicates are ch.

Leading classes of ~ch predicates will be already familiar:-

$\overline{\text{Ch}}$(1) Ontic predicates. Representative are those predicates such that they or their negations imply existence or its negation. Thus 'exists' is ontic, so is 'is created', 'dies' etc. So also are such modal predicates as 'is possible' since its negation implies nonexistence. Included in this class, too are other predicates of the modal subclass such as 'is contingent'.

$\overline{\text{Ch}}$(2) Evaluative predicates. This class is commonly contrasted with Ch(1). Predicates such as 'is good', 'beautiful', ..., which are often said not to yield properties, are almost consequential on accumulation of descriptive predicates, e.g. a motor car that satisfies a string of predicates such as 'is rusty', 'has bald tyres', 'lacks instruments', etc., virtually excludes satisfaction of the predicate 'is good'.

$\overline{\text{Ch}}$(3) Theoretical predicates. These include not only predicates of the theory of items itself, such as 'is determinate', 'complete', etc., but also such predicates as 'simple'. They are excluded for reasons like those Meinong adduced.

$\overline{\text{Ch}}$(4) Logical predicates. Prime examples are identity determinates. Other examples are predicates from set and attribute theory, e.g. set membership. To see the point of excluding extensional identity, consider ξx (x is prime minister of Australia & x = President Carter). If FCP applied it would follow that President Carter is prime minister of Australia.

$\overline{\text{Ch}}$(5) Intensional predicates. Typical are predicates such as 'is much sought after', 'is often thought about', 'is observed (by d)', 'is believed in'. None of these predicates serve in genuinely characterising an object, e.g. d's observing the cheese is not part of the nature of the cheese and makes no difference to how it is. The restriction of characterising predicates to the extensional is important in allowing intensional attitudes to be freely taken up towards arbitrary objects delivered by the axioms.[1]

A theory of objects itself helps to enforce the requisite distinctions. Suppose E, i.e. 'exists', were characterising. It is given by Ch(1), as paradigmatic, that ch(r) where r is, say, 'is round'. Then by FCP, dr & d~r & dE where

d ≈ ξx(xr & x~r & xE). But as ext(r),

dr & d~r ⊃. ~dE which is impossible. Hence ~ch(E). Parsons has in effect observed (in 78) that given some predicates from Ch(1) are indeed ch, very

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[1] Also intensional predicates could induce relations to entities that these latter may not have.

many predicates of classes $\overline{Ch}(1) - \overline{Ch}(5)$ can be shown to be correctly assigned by applying HCP. One consequence of HCP, using the Abstraction Axiom, is

(*P*) If for some set α of ch predicates to which g does not belong, every object that satisfies every predicate of α satisfies g, then $\sim$ch(g).

For let A determine α. Consider $t \approx \xi x(\text{chf})(xf \equiv A(f))$. By HCP, $(\text{chf})(tf \equiv A(f))$, so $\text{ch}(g) \supset.\ tg \equiv A(g)$. By the antecedent of *P*, tg and $\sim A(g)$, whence $\sim$ch(g). To show that 'is impossible', for instance, is $\sim$ch, set $\alpha = \{r, \sim r\}$. 'Is impossible' does not belong to α and every object x such that xr & x$\sim$r is impossible, whence, by *P*, $\sim$ch (is impossible). Similarly for many other noncharacterising predicates (sometimes using however variations upon *P*).

The main problematic classes concern relational predicates (expressions of the form $(a_1,\ldots,x,\ldots,a_n)f$ after abstraction) which relate or compare nonentities and entities. Whether such one-place predicates are characterising depends *both* on the many-place predicates involved *and* on the terms occupying the other places and their arrangement. Although the ch/nonch distinction already delineated *can* be extended beyond one-place predicates - for instance, descriptive predicates are often ch, logical and theoretical predicates never are - it is by no means the case that a many-place normally characterising predicate all of whose places are occupied, except one, is a ch predicate: the occupied places must be satisfactorily filled as well. For example, a term which includes quantifiers or intensional or nonch predicates (as, e.g. $\xi x(xE \mathbin{\&} xh)$) will not be accounted satisfactory.

Ch(3) *Relational predicates* of the form $(x, a_2,\ldots,a_n)f$ which are extensional in their one (main)place, which contain a "descriptive" predicate f, and remaining constant terms $a_2,\ldots,a_n$ are either (free) names or descriptions which include no nonch components. To explain why this class of predicates appears to cause especial difficulties, consider expressions of the form 'a R-ed b' where 'R' represents some verb such as 'kill', 'marry', 'assault', 'touch', 'kick', etc., and b is a nonentity. Suppose, it is said, that (the x)(x R-ed b) is reliable. Abbreviating ιx(x R-ed b) by the (name) term d, by the basic Characterisation Postulate,

(i) d R-ed b.

Then by the normal passive transformation,

(ii) b was R-red to [by] d,

i.e. sometimes b R-ed d. But, for a large class of relations, including all the example cited, it then follows

(iii) b was R-ed (sometimes, b $\breve{R}$).

To illustrate:- Let d = ιx(x married Joan of Arc).

Then, by the CP, d married Joan of Arc; so Joan of Arc was married to d, and so Joan of Arc was married - which is false. The argument leads from true premisses to false conclusions, and hence is invalid. The problem is to locate where the trouble lies. There are three options for a consistent theory (paraconsistency offers no further viable option here):

(a) Such predicates as 'R-ed b' are not characterising, at least where b is an entity.
(b) The passive conversion fails in such cases.
(c) The transitive-intransitive inference fails.

It will be argued that (b) is the most feasible option for a theory of objects, and that, despite perhaps initial appearances, it is unproblematic. It is important to observe that neither traditional nor classical logic supply the inferences that are in question; so that in questioning (b) or (c) central logical principles are not being upset. Principles guaranteeing inferences like (b) and (c) are sometimes tacked on in applications of logical theory, e.g. as postulates (cf. Carnap's meaning postulates of MN, p.227, and the relational postulates for axiomatic geometry); but nothing stops their variation when a wider domain of objects is considered, and especially when impossible objects which are liable to upset "meaning postulates" are included.

Adopting option (a), though no doubt (in the light of classical theory) a consistent procedure, is crippling: it would rule out much that a theory of items aims to accomplish, and take it part way back towards the classical position that nonentities have no properties. For it would prevent Kingfrance from being a king *of France*, at most he would be a king; and it would rule out the obvious way of distinguishing him from a king of China, also a king. It would exclude Sherlock Holmes, as the detective who lived in London, ..., from living in London or anywhere else on earth. In addition, (a) would require the back-up of a sharp division of one-place predicates into pure or qualitative predicates as opposed to relational predicates. Such a distinction is problematic; it is difficult to make out, or maintain, without recourse to, what is independently objectionable, and best avoided, rigid primitive forms, that is to some form of atomism.

Option (c), while harder to defeat conclusively than might have been anticipated, appears implausible. Consider the woman who inhabits the centre of the earth, call her c. Then according to option (c), the centre of the earth is inhabited by c, and so is inhabited by someone but it is not inhabited. Similarly France is ruled by king d (d being the king who rules France), but is not ruled and is not (in *one* sense) a monarchy. (Even so (c) is left slightly open

Option (b) escapes these difficulties. It can allow the natural inference from "inhabited by c" to "inhabited" - at the cost, it will be said, of blocking the equally natural inference from "c inhabits the centre of the earth" to "the centre of the earth is inhabited by c". But is the passive conversion any more "natural" than the inference already blocked, in some cases, from "a is not round" to "It is not the case that a is round"? The claim will be that while the conversion is - like the predicate to sentence negation transformation - correct in many cases, e.g. where the relata are entities, it is not correct in all cases. One reason is this. While it is true (in a good intuitive sense) that Sherlock Holmes inhabited London, and true of Holmes that he did this, it is not true of London that it had Holmes as an inhabitant or resident. Yet the passive conversion, which enables the conversion of a relational property of d to b into a property of b, would allow us to conclude that it is true of London that Holmes was among its inhabitants. When are such transformations as passive conversion admissible?

7. *Entire and reduced relations and predicates*. Entire relations are those which to put it roughly, satisfy the full range of classically expected logical relations and inferences. For example, if *due south of* is entire then it will be (at least in all ordinary terrestial contexts) transitive, asymmetric and irreflexive, it will permit passive conversions, and also replacement of each relatum by extensional identicals. By contrast, reduced relations satisfy only a reduced class of these features. An occurrence of a many-place predicate is said to be *entire* or *reduced* according as the relation signified is entire or reduced. For example, the occurrence of 'lived at' in 'Holmes lived at 221B Baker St., London" is a reduced occurrence; for passive conversions is excluded, and so is replacement of identicals, e.g. even if 221B Baker St. is,

or was, (as D. Lewis suggested) a brewery, it would not be legitimate to infer that Holmes lived at a brewery.[1]

Adoption of the entire / reduced distinction is no concession to the Reference Theory. For the necessary and sufficient conditions for the entireity of relations are not that the relations exist, or even that the relations are extensional and that the relation exists. Entire extensional relations may hold between nonentities, and even between entities and nonentities (see especially chapter 9). Relations of the working logic are (taken to be) reduced unless otherwise indicated, e.g. by explicit say so or through devices such as superscripting.

The notion of entireity may be extended to one-place predicates (though no use will be made of it in this connection, and it can be misleading) and also to statements. A statement is entirely true if, again roughly, it is true and all classically expected (but neutralised) inferences are warranted. Thus, while it is entirely true (in this sense) that Holmes ε $\{$Holmes$\}$, it is not entirely true that Holmes lived in London, though it is true. This gives locutions which corresponds well with what some of us do say.

Use of the entire/reduced contrast helps in resisting various unsavoury doctrines by which one might otherwise be more easily tempted. One of these is Parson's elaborate theory of relations (of 74 and 78) or rather for reducing many-place predicates to one-place by "plug-up" procedures. Another is the adverbial theory that would eliminate various many-place relations in favour of one-place predicates by devices such as hyphenation or concatenation. Thus too certain extensions of Characterisation Postulates that perhaps would otherwise be appealing lose their attraction.

8. Further extending Characterisation Postulates. In order to apply the theory of items satisfactorily, especially to philosophical puzzles and other problems presented normally in natural language, a still more generous class of characterisation postulates is wanted (as later chapters will reveal). There are several ways of extending the postulates already given at competitively little cost. Some of these ways are desirable, some far from desirable. The main method consists in enlarging the class of predicates. There are various ways of doing this, some of which apply in natural languages. The more interesting cases are those where operations on predicates yield new predicates.

(a) The generation of further ch(aracterising) predicates by concatenating or neutralising, compound or relational predicates. Thus, for example, the concatenated predicate 'is$\frown$ten$\frown$miles$\frown$south$\frown$of$\frown$Dunedin' obtained from the relational predicate 'is ten miles south of Dunedin'. The effect of concatenating is to bind up previously separate parts, and so render them inaccessible to logical operations, e.g. quantification of the term 'Dunedin'. Since a concatenated predicate is unitary and undissolvable into logical parts, it can be safely assumed reliable. For instance, the problem that reliability of the entire description 'the city which is ten miles south of Dunedin' leads to, that it implies, what is false, that Dunedin has a city ten miles south of it, is blocked by the concatenated predicate for there is no separate term 'Dunedin' that can be extracted as an independent subject. But while concatenated predicates avoid reliability problems they lead to others, such as the embarrassing questions What meaning do they have? How is the meaning related to that of the original unconcatenated predicate, etc.? Difficult questions, because such extensive concatenation does not occur in English for example.

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[1] Reduced occurrences of predicates connect with contextually intensional occurrences, as will become clearer in chapter 7, §7.

Formal representation can be obtained by adding a concatenation operator $\frown$ on phrases to the logic. But while the introduction has a good point for other logical investigations (as Tarski showed for certain meta-logics), it has little as regards extending the power of CPs. More to the point is

(b) the production of further predicates, some of them characterising, by hyphenating. Hyphenating differs from concatenating in that a hyphenated predicate, such as 'is-ten-miles-south-of-Dunedin', terms are not rendered inaccessible to logical operations such as quantification. What is ruled out is rearrangement, as in passive conversion. Thus hyphenating an entire predicate has the effect of reducing it. To represent hyphenating let us add to the logic a hyphenating operator h, applying to well-formed phrases (primarily to predicates). Then h( ), which is of the same syntactical type as ( ), is the hyphenation of ( ). Thus where a and b are words in sequence, h(ab) is a-b. The logical properties of hyphenation are straightforward, e.g. it is associative but not commutative, $h(h(\ )) = h(\ )$, etc. Hyphenation affords an approximation to Parson's plugging-up procedures for predicates (already alluded to). However almost no use will be made of the operation in what follows.

(c) The generation of further ch predicates by presentation, or supposition, operators. For example, given the predicate f, the operation s yields the predicate s(f) - also written sf - read 'presents itself as f' or 'says of itself that it fs' or 'has suppositious f-ness'. The first conditions on s are these:- if $\sim$ch(f) then ch(sf); if ch(f) then $sf \approx f$. Hence $\vdash$ ch(sf); $\vdash ssf \approx sf$. The "suppositious" terminology, adapted from Meinong, is thus somewhat misleading, since sf is presumably extensional. Such new ch predicates can be used at once in CPs such as HCP.

But more is expected of s operations. Consider t, where $t \approx \xi x(xf \ \&\ xg)$, e.g. 'an existent round square', with ch(g) and $\sim$ch(f). Then an appropriate CP would yield the result that tsf and tg, e.g. an existent round square is round and square and presents itself as existing. The general principle (so far only very partially defined) is

JCP. $sA(\xi xA)$, for every A for which sA is well-defined. Given further clauses extending s component-wise to certain wff - such as $s(\underset{\sim}{t}f) \approx \underset{\sim}{t}sf$, $s(A \ \&\ B) \approx s(A) \ \&\ s(B)$ - it clearly follows that tsf & tg. The relevant principle says not that an item which purports to be f purports to be f, but that an item which is f presents itself as f.

The operator s will be included in the logic because it enables a simple solution to be given to a small but vexing problem for any theory of objects (it is also a problem for rival theories, though it is an anomaly that has been shrugged off by the insensitive status quo). The problem is how is c, an existent round square, distinguished, or to be distinguished, from d, a round square? The answer is simply that c is sE while d is not. What is more c and d differ extensionally, i.e. $\sim(c = d)$.

JCP provides the sought replacement for the failed *GCP. *GCP was intended, among other things to accommodate partial reliability, and this JCP does, in a more satisfactory way (since *GCP did not yield the distinction between c and d).

Presentation operator s performs some of the tasks Meinong tried to achieve through his depotenzierte ('watering down') operator, which paradigmatically takes "which exists" to "existent" and more generally takes f to "substrength f". To what extent s approximates Meinong's operator, d say, is rather unclear and will be left unresolved. But one of the things Meinong noted, in effect as regards d, is worth considering for s. That is, where an object exists, the difference between sf and f vanishes, i.e. $tE \ \& \ extf \rightarrow. \ tsf \equiv tf$, and more generally

SA. $\underset{\sim}{t}E \ \& \ extf^n \supset. \ \underset{\sim}{t}sf^n \equiv \underset{\sim}{t}f^n$, where $(t_1,\dots,t_n)E =_{Df} t_1E \ \& \dots \& \ t_nE$.[1]

The converse of SA demonstrably fails. Existence is sufficient for the sort of reliability s-reduction marks but is far from necessary.[2] SA yields at once abstraction principles giving characterising features of existing objects, notably $(Pchf)(U\underset{\sim}{t}E) . \underset{\sim}{t}f \equiv A$, with f not free in A, and forms of ECP, specifically $(\xi x\tilde{A})E \supset^{\sim} A(\xi xA)$, where A is of weakly restricted form, but not necessarily constructed from ch predicates. For A(x) is of the form $xf_1 \ \& \dots \& \ xf_n$ (with each f_i any predicate, negated or not). By SA, $(\xi xA)E \supset. \ (\xi xA)sf_i \equiv (\xi xA)f_i$, for each i, whence $(\xi xA)E \supset. \ (\xi xA)sf_1 \ \& \dots \& \ (\xi xA)sf_n \equiv. \ (\xi xA)f_1 \ \& \dots \& \ (\xi xA)f_n$. But by JCP, $(\xi xA)sf_1 \ \& \dots \& \ (\xi xA)sf_n$, in virtue of the form of A. Hence $(\xi xA)E \supset. \ (\xi xA)f_1 \ \& \dots \& \ (\xi xA)f_n$; and so the result.[3]

Much as the desired part of FCP was absorbed in HCP, so the positive JCP can be supplanted where it is well-defined by a principle which also, like HCP and unlike JCP, is negative in excluding predicates. An argument like that leading to HCP leads firstly to

KCP. $(Px)(f)(xsf \equiv A)$, with x not free in A.

KCP implies HCP. For given for some x, $(f)(xsf \equiv A)$, suppose chf. Then $xsf \equiv xf$, whence HCP qualificationally. KCP is not however fully adequate for subsequent purposes or indeed for deriving JCP. Also needed is specification of a particular for which KCP does hold, as follows:-

KCP'. $(f)(z_0sf \equiv A)$ where $z_0 = \xi x(g)(xg \equiv A)$ and x is not free in A;

roughly, an object as such which is A is precisely sA. Then (given replacement principles) JCP results, much as FCP followed from HCP.

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[1] Axioms of this form are due to Parsons (see 78), who exhibits their power. Note that s differs from Parsons' w operator not only in its setting in a different theory, but through axiomatic constraints such as JCP and in its intended interpretation.

[2] Restricted s-reduction corresponds to reliability; for $sA(\xi xA) \equiv A(\xi xA) \equiv.$ A is reliable. Existence is sufficient only in extensional cases. It may be that FCP should be similarly qualified.

[3] It is somewhat tempting to extend SA to

SAA. $\underset{\sim}{t}E \supset. \ sB(\underset{\sim}{t}) \equiv B(\underset{\sim}{t})$,

and so to derive ECP, since immediately $(\xi xA)E \supset. \ sA(\xi xA) \equiv A(\xi xA)$, and $sA(\xi xA)$ by extended JCP. This involves extending s to take wff into wff, a move that has not been sufficiently investigated so far (there remain genuine worries as to the adequacy of SAA). Note that in general s cannot be extended componentwise, e.g. s((Pf)B) cannot be equated with (Pf)sB.

(d) The production of new predicates by the taking up of context, e.g. from the entire predicate 'lived in London' results 'lived in the London of the Holmes' stories', from 'exists' results 'exists in Shakespeare's England', etc. The method differs from the earlier systematic more syntactical methods, is hard to formalise, and will not be adopted. Some of what the method will achieve is better accomplished by subject transformation, e.g. of 'the triangle', 'the plane' etc., to 'the Euclidean triangle', 'the Euclidean plane', etc., of 'England' to 'Shakespeare's England' etc., which are sometimes important in ensuring such properties as truth and analyticity. (As to how such "duplicate" objects are defined, see 7.8).

9. Russell vs. Meinong yet again. Russell's first argument against Meinong is defeated because (as thought traditionally) sentence negation cannot serve in characterisation.[1] Russell's second argument[2] is defeated, in the first instance, because 'exists' is not a characterising predicate. And rightly. For duly restricted Characterisation Principles should not guarantee (Px)xE, something exists, as a matter of logic. Contrary to a priori theology and classical mathematics, the existence of an item should not be provable simply by logical means. Thus the theory of items escapes Russell's Ontological Argument against Meinong, in a way recommended by Meinong. That way is a way Meinong was (perhaps reluctantly) forced to pursue in the case of full-strength existence, namely through Kant's thesis that existence is not a characterising property. There is a good Meinongian case for this approach, and for Meinong's eventual restriction (in Mog) of UCP to predicates of so-being (cf. Findlay 63, p.105). For the pure object, according to Meinong, is indifferent to and stands beyond both being and non-being; these distinctions are introduced from outside, they are external. Whether an object is or not makes no difference to what an object is, to its so-being, how-being or what-being. What the object is, its real essence, consists in a number of determinations of so-being, and such determinations are possessed by the object whether or not it exists. Being or not being have nothing to do with the object as object, though in some cases the so-being of an object implies its non-being. Consequently we cannot make existence, or any other sort of being, part of the nature of a Meinongian object, or include it in characterisation principles (see further 12.2).

However Meinong was dissatisfied with such a simple answer. As is well-known, he tried to evade Russell's conclusion by what looks like, and has been seized upon as, a classic piece of theory-saving - but saying that the existent round square is existent but that it does not exist because it lacks the modal moment. Russell denied that he could find a difference between 'is existent' and 'exists', and certainly the modal moment doctrine is neither especially perspicuous nor as usually explained very convincing. It is obscure whether weak existence is an existence notion, how the modal moment lifts weak existence to full-strength existence; and it is unclear why Russell's ontological argument cannot be immediately re-presented using full-strength existence. Meinong's reason for treating weak existence as part of the so-being of an object seemed to be that he wanted to allow not just that one can assume anything one likes, but that the assumed item really has all the supposed features. The latter thesis has to be given up, but it is separable from the former. Of course one can suppose anything one likes, only it won't always (consistently) possess all the supposed features.

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[1] In the consistent theory. In the appealing paraconsistent alternative, Russell's first argument simply vanishes. Who would expect a contradictory object to be other than contradictory? (See further chapter 5).

[2] To be precise, the second argument did not touch Meinong, but only Meinong and his students as holding a common doctrine. All Meinong strictly offered were some cases of a CP: it was Ameseder who threw in the predicate 'exists'. And then Russell could argue that as the round square is round, so presumably the existent round square is existent, i.e. exists.

There is nonetheless a real point to Meinong's dissatisfaction, which is that the simple answer, on its own, leaves no way of separating the existent round square from the intuitively distinct round square. To effect the separation something like Meinong's substrength operation d seems to be essential. Hence the introduction of operation s and the more elaborate JCP to effect the distinction in the theory of items. But with this apparatus there is no call to try to force a distinction between between 'existent' and 'which exists'; for Russell's second argument is defeated as before, namely 'which exists', like 'exists', is not characterising.

10. Strategic differences between classical logic and the alternative logic canvassed. The approach to assumption and to characterisation postulates illustrates the general difference in approach and strategy between the alternative logic being designed and classical logic and its extensions. The approach is to admit anything for consideration, to maximize expressibility, to follow natural discourse in its liberality as regards what can be expressed, in contrast to classical approaches, which aim to severely regiment language, and which drastically restrict what can be said. Simple and familiar examples of heavy-handed classical methods are the levels-of-language theory, type theory and its variants, the exclusion or curtailment of a range of natural language predicates beginning with 'exists' and in some cases including much of intensional discourse. The strategy of maximizing expressibility (with minimum mutilation or reductive analysis) means maximizing what goes into the logic, which parts of discourse the logic can accommodate, and attempting to formulate or impose restrictions explicitly in the logic itself as conditions on logical behaviour, in contrast to the classical logical procedure of operating with and relying heavily upon extra-logical restrictions which greatly limit the range of discourse, e.g. subject terms and predicates admitted to logical treatment.

There are several objections to the classical approach. The restrictions are commonly vastly over-restrictive, they cut out far more logically than is necessary or desirable, as slight adjustments to the logic make plain, and they greatly and unnecessarily reduce expressibility. For example, in order to achieve a limited restriction an entire class of predicates is rejected. Moreover because the restrictions are prelogical and not sharply formulated, the real reasons for restrictions are frequently not examined and instead pseudo-explanations are offered. For illustration consider the classical logical treatment of the Ontological Argument, and the alleged discovery (after Kant) that existence is not a predicate. What is wrong with the Ontological Argument is said to be that it treats existence as a predicate, whereas in fact existence is not a proper, or logical, predicate. This is a pseudo-explanation; for the admission of existence as a predicate by no means guarantees the validity of the Ontological Argument or its variants; so the exclusion of existence as a predicate cannot be what is wrong with the Argument. Classical logic has not in fact produced a satisfactory explanation of what is wrong with the Ontological Argument. It is prohibited from doing so by its refusal to admit existence: it can not look through or into the argument formally: its restriction prevents it from getting to the bottom of what is wrong with the argument. It has been content with imposing an arbitrary extralogical restriction on the class of admissible predicates, which throws out good arguments along with bad and does not face the issue of how to distinguish between them, and therefore of providing a genuine explanation (cf. cutting off a head to stop a headache; the method of classical levels and type theories).

What has to be assured to obtain an Ontological Argument is not that existence is a predicate but that it is an invariably reliable, or characterising, predicate.[1] It is this assumption and not the first that is objectionable. An object cannot successfully determine just in virtue of its description its own ontic properties, for example its existence or its possibility. Existence and possibility are on all fours in this regard, and existence is simply one member of a class of predicates which are not invariably reliable. If objects could determine their own ontic status, they would be able to determine by pure postulation features which cannot be determined in this way, and which are independent of postulation, e.g. whether or not something exists. This explanation ties in already with one's intuitive feelings about the Ontological Argument, that if it were correct items could be conjured into existence by their own characterisations or definitions, things could be determined which are not open to determination by postulation (or definition), because they are already independently settled by features of the actual world. The solution is not to legislate to stop all logical conjuring tricks: it is rather a matter of seeing what the conjurors are doing, finding out how the tricks are done, and not accepting everything they do at face value. The Ontological Argument is a conjuring trick, it lifts an object from Aussersein to existence, but the response of classical logic on realising that it has been tricked is to outlaw all conjuring; a more sensible response would be to try and work out how conjurors perform the trick, and why it is a trick, and remember not to be gulled in the future.

If the alternative logic maximizes expressibility, how does it avoid paradox, unwanted inconsistency and collapse? As the discussion of the Ontological Argument begins to reveal, by not taking all tricks and assumptions as given, all presentations as reliable. The approach is logico-phenomenological certainly: all logical phenomena are admitted and studied for what they are and as far as can be without distortion or subjection to preassigned and quite possibly defective moulds, positions and logical structures; but the approach is also alive to, and makes due allowance for, items which represent themselves as possessing features which they do not have.

11. The contrast extended to theoretical linguistics. Though modern linguistics takes much fuller account of the linguistic data than philosophy, including "ordinary language" philosophy, ever did, most of theoretical linguistics is still highly reductionist and referential in character. The classical logicians' picture of natural language as at best decidedly systematically misleading (and at worst totally incoherent) and in need of replacement by a refined canonical language involving only clear and distinct notions (e.g. referential ones) is transposed in theoretical linguistics into a contrast between natural language which is irregular, seriously incomplete, and full of ambiguity, and in need of analysis in terms of a deep structure which is unambiguous and appropriately complete (distinct and clear), and almost invariably referential. The two parallel reduction programmes, that to a canonical logical language and that to deep structure have been combined by the

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[1] The same applies to properties that imply existence, such as the perfection property used in the traditional Ontological Argument.

conjecture - rather obvious once the parallel has been discerned, and the connection between logical transformations and "grammatical" transformations noticed - that deep structure just is canonical logical form. In its most simple-minded, and conspicuously inadequate, form the conjecture has been that deep structure is provided by classical quantification logic; a less inadequate proposal is that the logic involved is a λ-categorical logic.

The parallel has meant that, and is reflected in the fact that, linguists are often working over the same ground, and with the same mistaken referential commitments, that philosophers have worked over before, e.g. in such areas as reference, presupposition, contextial implication; and that recent linguistic "discoveries" parallel older philosophical "findings".

The noneist theme is that just as an analysis of natural language into canonical logical form is not required - it is not disputed that the procedure can have its illuminating aspects, along with its damaging ones - so an analysis into deep structure is not required.

Just as the logical reduction has been forced by a mistaken theory, the Reference Theory, so the location of ambiguities, which are said to require resolution in a deeper structure, is very often the product of applying the same referential assumptions. Just as logic functions, on the noneist picture, not as a superior replacement for actual language, but as an addition to it, as extension of it, so linguistic analysis becomes a superstructure built on natural language which does not require reduction to a "deeper" canonical form. The fact that a canonical form cannot cater for surface structure commonly shows, not the unsatisfactoriness of the surface form, but the inadequacy of the canonical forms.

§22. Descriptions, especially definite and indefinite descriptions. Although the emphasis will be upon [certain] singular descriptions, as opposed for instance to plural descriptions, it is easy to say something of worthwhile generality about all descriptions.

1. General descriptions and descriptions generally. A descriptor τ is an operator which combines with variables and wff to yield a subject term, binding the given variables in the process; the result, e.g. $\tau x_1 \ldots x_m(C_1, \ldots, C_n)$, is a description, with $x_1 \ldots x_m$ bound variables.[1] The insertion of variables in the course of formally paraphrasing natural language descriptions enables elaborate cross-referencing to be tracked and descriptions to be readily linked to, and sometimes eliminated by, quantified expressions; but the main reason for the introduction of variables is to facilitate quantificational paraphrase. Natural language descriptors typically apply to general terms, and quantificational theory can only approximate general terms by way of predicate transformation and variabilisation. To be more explicit:- General terms are formally paraphrased, usually, in terms of variables concatenated with a predicate transformation of the term: m[an] is replaced by 'x is (a) m[an]', xm for short. Thus too the need for introduction of a variable with a simple description such as 'the' and the requirement that 'the' serves to bind the variables; for 'the m[an]' is transformed to 'the xm[an]' which makes no sense without the insertion of 'x(such that)'.

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[1] Full logistic accounts of generalised descriptors and quantifiers are given in Slog, chapter 3.

1.22 DESCRIPTIONS GENERALLY AND THE QUINE-GEACH THESIS

English descriptors include not just the definite descriptor ('the') and the usual indefinite descriptor ('a'), but also such descriptors as 'a certain', 'an arbitrary', 'any' and 'each'. They include, in addition, what are nowadays formally paraphrased as quantifiers, 'every', 'all', 'most', 'many', 'some', 'no'. For in each case these operators applied to general terms yield subjects, often plural subjects but sometimes singular subjects. For example, 'every man' is a (complex) subject in English, not a sentence. It is not so easy to isolate a slick criterion which determines just which English descriptors are, or should be, formally displaced by quantifiers; indeed it is commonly supposed that none need be sought since all descriptors should be so displaced. If the subjects admitted in quantificational logic are restricted to singular subjects, as they usually are (plural subjects causing some trouble), then several English descriptors, including many of those expressed as quantifiers, are excluded, e.g. all, most, many. Since it is commonly assumed that other quantifiers, such as the invariably singular 'every', 'each' and 'any', and the variable (sometimes singular and sometimes plural) 'some' and 'no', can be defined in terms of the invariably plural forms, the nonsingular test provides an initial demarcation line (initial, because classical theory shows that classical definite and indefinite descriptors can also be eliminated in favour of quantifiers).

The Quine-Geach thesis is that *all* English descriptors can be adequately paraphrased quantificationally, using classical quantifiers. That thesis is false, as the discussion of definite descriptions in part III above reveals 'the for example, cannot be so eliminated preserving truth. The extent of the failure of the Quine-Geach thesis has been well-illustrated by Vendler 62, who reveals the complexities of the descriptors 'each', 'all', 'every' and 'any' - complexities to which *classical* quantificational paraphrases fail to do much justice. Vendler, however, overstates his case: he proceeds to a conclusion which his examples in no way support, namely that formal logic is unable to account for the behaviour of natural language quantification. This is to suppose, quite erroneously, that formal logic is exhausted by classical quantificational theory, and that the paraphrases of descriptive expressions into quantification logic that have been assembled by Quine and Geach (most of them derive from Russell and others) exhaust the options for formal logic. On the contrary, formal logic is *far* from exhausted by classical quantification theory and straightforward extensions. Other logical frameworks such as combinatory logic and Church's type theory (of 40), offer rather different ways of paraphrasing descriptive expressions. The methods these alternatives lead to (explained in §24) are sufficiently general to enable accurate paraphrase of any exact theory of descriptors, including a tightening-up of Vendler's proposals. And even within the classical quantificational scheme of things, there are important alternatives to quantificational paraphrase of descriptive expressions, e.g. uneliminable descriptive phrases can be simply admitted,[1] or descriptors can be treated as binary functors (as in SE).

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[1] A general theory of descriptive operators in quantificational logic has been worked out by several researchers independently. A readily accessible presentation is in the final chapters of Kalish and Montague 64. The "general" theory has however a serious flaw, namely the extensionality assumption that classical theory tends to force for want of more stringent equivalence relations, e.g. in the case of a simple descriptor τ: $A \equiv B \supset. \tau xA = \tau xB$, or (a minor improvement) the strict form: $A \equiv B \rightarrow \tau xA = \tau xB$. Such extensionality principles for the definite descriptor have already been criticised in §14 in the examination of Scott's theory. The objections generalise to other descriptions.

Even if formal logic does have ways of paraphrasing any descriptor that satisfies a set of axiomatic conditions (as §24 explains), in the case of most natural language descriptors it is obscure what axiomatic conditions govern the logical behaviour of the descriptors, and whether general conditions can be found which serve to characterise one descriptor as opposed to another. In short, the logic of most natural language descriptors remains somewhat opaque. The discerning of the logic of most of the descriptors is not however a problem peculiar to noneism, nor is it of immediate importance. For leading noneist theses can be satisfactorily stated and investigated using just the quantifiers already introduced, and but a few simple descriptors. In this section the descriptor that has received most study, the definite article, 'the', gets prime consideration; but two forms of the indefinite article 'a' will also be studied, 'a (definite)' and 'an (arbitrary)'. But many of the general points about descriptors apply also to other descriptors.

2. *The basic context-invariant account of definite descriptions*. Since descriptions are not incomplete symbols, descriptions need not be defined just in contexts. Descriptions can be admitted as full logical subjects, on a level with proper names and subject variables. As the interpretation in no way depends upon a distinction between (logically) proper names and descriptions it would be perfectly proper to introduce ι as a primitive symbol, and to add appropriate postulates for descriptions. This course, which will eventually be adopted, is not necessary for initial purposes, which aim at obtaining noneist replacements for classical and free description theory, that is to say, theories in which uniqueness is assessed absolutely and not contextually (cf. §11). Since choice descriptions have been introduced as primitive, definite descriptions may be defined in terms of ξ, thus:

Dι. $\iota uA(u) =_{Df} \xi uA!u$,

where A!u reads 'u satisfies A uniquely'. The problem is how to specify uniqueness in the vast domain of objects. First attempts simply add to A an absolute (i.e. context-invariant) uniqueness clause, as follows:

Dι1. $\iota uA(u) =_{Df} \xi u(A(u) \,\&\, (Uv)(A(v) \supset. vIu))$,

i.e. $\iota uA(u)$ is defined as $\xi !uA(u)$, where I is some identity determinate governing the uniqueness determinate. That is, *the u which satisfies A is an (arbitrary) unique u which satisfies A*; the f is an unique f. The theory thus accords with - indeed, apart from the use of ξ, scarcely adds to - Russell's remark (in MP) that 'the only thing that distinguishes 'the so-and-so' from 'a so-and-so' is the implication of uniqueness'. More generally, then, *'the' is a determinable characterised in terms of the other determinables* 'a' and 'unique', *as 'an unique'*. In the context-invariant case the uniqueness determinable is in turn characterised in terms of the determinables 'every', 'if' and 'is (identical with)', i.e. A!u is defined thus:

A!u $=_{Df}$ A(u) & (every v)(if A(u) then v is identical with u).

The uniqueness determinate selected classically is, as should be expected, thoroughly referential. It amounts to uniqueness in world $\underline{\underline{G}}$ where everything exists and is splendidly extensional. No nonexistent Eiffel Towers, with different heights or of different materials from the actual horror, interfere with the existentially unique one. But the classical referential uniqueness determinate is not adequate even in existential cases (as we shall see); it is even more unsatisfactory neutrally. Nonetheless it is worth working with an analogue for a while.

1.22 ELABORATING THE THEORY

It is perhaps surprising, given the incompatibility of the theory presented with Russell's theory, how many of Russell's remarks about definite descriptions (in MP, p.21 ff.) are vindicated by the theory. For the theory of descriptions which emerges differs substantially from Russell's theory. In particular, these results follow *without qualification* from logical properties of ξ: as in free logic, $\vdash \iota vA(u)\ I\ \iota vA(v)$, i.e., as in free description theory, identity is fully reflexive; but unlike free logic, $\vdash (Uu)B(u) ⥽ B(\iota vA(v)/a)$, i.e. definite descriptions are full subject terms and can *always* replace or instantiate variables (given only an initial rewrite of bound variables).

The theory of descriptions, which applies in principle to any sort of objects, particular, propositional or attribute, consists, so far then, of two parts: first, *a* theory of indefinite descriptions in terms of a choice descriptor ξ (the theory will shortly be enlarged to include other sorts of indefinite description that occur in natural language); and secondly, based on this, a theory of definite descriptions. The main application of the theory will be to bottom order objects, to particulars - objects that are characteristically separated from intensional higher order objects through the identity conditions they meet. For bottom order objects the appropriate identity determinable is extensional identity, and, correspondingly, the appropriate context-invariant uniqueness condition is extensional uniqueness. Hence the initial working definition, within quantification theory interpreted over bottom order objects (as it commonly is, but certainly doesn't have to be), namely:

$$\text{D}\iota 2.\quad \iota xA =_{Df} \xi y(A \ \&\ (z)(A \supset .\ z = y)).$$

Almost all of what follows will be set within the same quantificational framework, i.e. the theory is essentially first-order in form though it admits of higher order application to higher order objects, where it connects with the λ-theory. In pure modalised second-order-theory, the appropriate identity determinable for attributes is strict identity, or what comes to the same in that restrictive setting, Leibnitz identity, i.e.

$$\iota fA = \xi g(h)(A \equiv .\ h \equiv g).^{1}$$

The theory of descriptions, in terms of selection of objects, combines well with the account given of proper names (outlined at the end of §14). It thus satisfies the requirement (of §14) that there is no sharp boundary between names and descriptions: they receive an overlapping logical role. Furthermore the theory given satisfies conditions (ai)-(aiii) of §12 (p.130). Descriptions are not incomplete symbols, each has an independent meaning, in particular *each signifies something*. For $qu(\iota xA)\text{Des}\ y \equiv .\ \iota xA = y$ and $\Box(Py)(\iota xA = y)$. It may be objected that the theory specifies too much, that when uniqueness or particularisation conditions fail, designations are undefined or should be defined differently from the rather arbitrary way the theory assigns them. Some of these problematic assignments are forced by the context-invariant character of the uniqueness requirement. The wrong assignments will tend to be made on any theory that does not take due account of context. But some are enforced by the interpretation of ξ, which assigns arbitrarily when its condition is not satisfied. There are two questions here: should it assign at all in such cases, and it if should, should it assign in a less arbitrary fashion. Needless to say, theories can be devised which adopt

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[1] Should the biconditional also be increased to strict strength? Very likely. In more adequate settings the minimal determinable for attribute identity is coentailment.

(perhaps different) epsilon operators which do not make assignments or which assign differently. As usual, choice among the different theories or interpretations is not a matter of convention or convenience, as the pragmatically inclined would have. The no-assignment choice is a poor one because it sacrifices needlessly the important intensionality thesis that every (meaningful) term signifies an object (at least of thought); and it leads immediately to difficulties for the assessments of descriptions in larger intensional sentence frames. For example, if no assignment is made to 'the author of PM' then it is awkward accounting for the truth of 'Bleerbhotham believed that the author of PM wrote several other books'. Similar examples reveal that a purely arbitrary choice of object when the condition fails is less than satisfactory. An appropriate choice (which can be accommodated in ξ theory) would still select ιxA from $\{x: A(x)\}$ in the case of uniqueness failure, and would thus assign 'the author of PM wrote several other books' value true, rather than false or (what the logical theory does not so far allow for) unassigned. Assigning the value true does not, however, rule out the correction: What you said is inaccurate; PM had two authors, each of whom wrote several other works.

There is moreover a serious objection to the use of arbitrary assignments for ξ-terms when the conditions are not satisfied, namely that the uniqueness condition given will very frequently fail, certainly with nonentities. For consider, e.g., the round square, $rs \approx \iota x(xr \;\&\; xs)$. It is not unique among round squares, for there are, by FCP, green round squares and blue round squares, and so on, and they are extensionally distinct from the round square. Since the green round square $\neq rs$, but the green round square *is* round and square, it is false that for every z, if $zr \;\&\; zs$ then $z = rs$.[1] The problem is, in accentuated form, the problem already observed in classical and free description theories, the problem of the nonuniqueness of "the red-headed man" (considered on p.140. The problem is resolved below by way of contextual restrictions, on A.) For the present - to achieve comparisons with classical theories - a classical-style escape may be tolerated: in the damaging application A is incompletely formulated and should have included further riders, e.g. it should add to zr and zs something like 'and z is among things indicated thus ...'.

Someone rightly dissatisfied with such an "escape" may argue that selection among round squares is forced with the failure of uniqueness if the initial (classically modelled) definition is not to yield wrong results. But if such an interpretational requirement *is* imposed then ιxA behaves logically precisely like ξxA. For it too selects an x such that A uniquely if there is one such and an x such that A otherwise. In short, the initial definition more satisfactorily interpreted collapses back into a neutral (and intensional) version of Church's theory of definite descriptions (of 40). On this account 'the' differs from 'an arbitrary' only by a contextual increment, a difference that is not reflected (so far) in the logic; that is, context excluded,

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[1] But of course there is a determinate in terms of which the (pure) round square is unique: it is - unlike *a* round square - the only object that is *just* round and square, that is it has no other properties. But making this simple proposal formally good is not entirely straightforward (and it too omits context). The (pure) round square can be defined thus:
$\iota x(xr \;\&\; xs) = \xi x(xr \;\&\; xs \;\&\; (z)(zr \;\&\; zs \;\&\; (\mathrm{ext}\ f)(zf \supset. f \approx r \vee f \approx s) \supset. z = x))$;
and one way of generalising the definition is as follows:
$\iota x A(x) =_{Df} \xi x(A(x) \;\&\; (z)(A(z) \;\&\; (\mathrm{ext}\ f)(zf \supset. A(w) ⥽_{w} wf) \supset. z = x))$.
We shall return to such pure objects subsequently.

Dι3. ιxA $=_{Df}$ ξxA.

One might try to get away with Dι3 on some such grounds (or pretext) as that a *full* theory of descriptions is not strictly needed, any more than a theory of proper names: In logic at least only so much is needed, the rest, such as additional contextual features, can be left undefined or open. But though Dι3 would make for considerable economies (e.g. in CPs), and does offer a general theory which includes both pure and ordinary objects (as explained in 7 below), our sights are set on much more than narrowly logical goals.

3. *A comparison with Russell's theory of definite descriptions*. Russell's theory of definite descriptions consists - in the simplified form of MP, where scope is largely neglected - of two definitions:

(α) A definition of (ιxxg)E, such that logically (ιxxg)E ≡ (∃y)(yg & (∀z)(zg ⊃. z = y))

(β) The following definition of (ιxxg)f:

(i) there exists an item which is g, and (ii) anything which is g coincides with that item, and (iii) that item is f. As already explained (in §§12-13), an initial weakness of this theory is that it requires *two* definitions, and that no provision is made for ontic predicates other than 'E', such as '◊'. Another defect of the theory is that in (α) 'ι' should carry no existential loading, whereas in (β) 'ι' must carry existential loading for the first clause of Russell's analysis to be cogent. Furthermore some restrictions on the class of f for which (β) holds must be imposed: it is, for instance, quite unsatisfactory to instantiate f by an ontological predicate such as ~E or ◊. Consider the consequences of assigning '~E' for 'f' in (β). Since ⊢ ~(∃x)x~E, it would follow ⊢ ~(ιxxg)E, *whatever* property g may be, contradicting (α). In fact a drastic restriction on the class of f for which (β) holds is needed, as counterexamples (of §12) demonstrate: even when scope is duly allowed for, many intensional predicates must be excluded. Thus not both (α) and (β) can be expected to hold without qualification. Not both do hold, since together they imply the mistaken (ιxxf)E ≡ (ιxxf)f (PM, *14.22). And not both can hold since Russell's theory is inconsistent with the unrestricted theorems ⊢ (Ux)xf ⊃ (ιxxg)f, ⊢ ιxxg ≈ ιxxg (whichever definition of ι is adopted).

But *both the fundamental definitions of Russell's theory (α) and (β) do reappear in modified forms, which* incidentally *provide correct conditions on the truth of (α) and (β)*. In place of (α) the following result is derivable (among others: for there are other analogues than that using Dι2):
⊢ (ιxxg)E ⥼⥽ (∃y)(yg & (Uz)(zg ⊃. z = y)).

1. RHS ⥽ (Py)(yg & (Uz)(zg ⊃. z = y) & yE)

⥽. (ξyA(y))g & (Uz)(zg ⊃. z = ξyA(y)) & (ξyA(y))E, where
A(y) ≈. yg & (Uz)(zg ⊃. z = y) & yE. Thus

RHS ⥽. [(ιxxg)g ⊃. ιxxg = ξyA(y))] & (ξyA(y))E.

Also

$\text{RHS} \rightarrow. (Py)(yg \,\&\, (Uz)(zg \supset. z = y)$

$\quad \rightarrow (\iota xxg)g.$ Hence

$\text{RHS} \rightarrow. [\iota xxg = \xi yA(y)] \,\&\, (\xi yA(y))E$

$\quad \rightarrow. (\iota xxg)E,$ since $\vdash E$ ref.

2. $\text{LHS} \leftrightarrow \xi x(xg \,\&\, (Uy)(yg \supset. y = x))E,$ i.e. $(\xi xB(x))E.$ But $\vdash \xi xB(x)E \rightarrow B(\xi xB(x))$, by ECP. Hence,

$\text{LHS} \rightarrow (\xi xB(x))g \,\&\, (Uz)(zg \supset. z = \xi xB(x)) \,\&\, \xi xB(x)E$

$\quad \rightarrow (Py)(yg \,\&\, (Uz)(zg \supset. z = y) \,\&\, yE)$

$\quad \rightarrow (\exists y)(yg \,\&\, (Uz)(zg \supset. z = y)).$

Turning to (β), an analogue of (βiii), $\vdash (\iota xxg)f \rightarrow (Px)xf$, is immediate. As the x that has g may not exist, since descriptions cannot be relied upon to carry existential commitment, (βi) does not follow from $(\iota xxg)f$. However (βi) does follow where the description is existentially-loaded, under the proviso that the item in question is reliable. Thus two cases are examined, first where the description does not carry existential loading, and second where it does.

First case: $\vdash (\iota xxg)f \supset. (Py)(yg \,\&\, (Uz)(zg \supset. z = y) \,\&\, yf)$, provided (ιxxg)ass. Since ιxxg is definitionally $\xi!xxg$, i.e. of the form $\xi xB(x)$, $(\iota xxg)\text{ass} \rightarrow B(\xi xB(x))$, i.e. $(\iota xxg)\text{ass} \rightarrow. (\iota xxg)g \,\&\, (Uy)(yg \supset. y = \iota xxg)$. So, provided (ιxxg)ass, $(\iota xxg)f \ni. (\iota xxg)g \,\&\, (Uy)(yg \supset. y = \iota xxg) \,\&\, (\iota xxg)f$, whence the result. $\vdash (Py)(yg \,\&\, (Uz)(zg \supset. x = y) \,\&\, yf) \supset. (\iota xxg)f$, provided r ref. The proof is similar to that given under (α), upon replacement of 'E' in that proof by 'f'. Combining these results $\vdash (\iota xxg)f \equiv. (Py)(yg \,\&\, (z)(zg \supset. z = y) \,\&\, yf)$, provided (ιxxg)ass & f ref, and hence provided (ιxxg)ass & f ext. The extensionality qualification may be removed by replacing extensional identity by Leibnitz identity throughout, by assuming the identity logic of PM. The assumptibility qualification may be weakened, to the provision $(\iota xxg)f \supset (\iota xxg)\text{ass}$. This provision too is in the spirit of PM; for $(\iota xxg)f \supset (\iota xxg)E$, by the Ontological Assumption, and $(\iota xxg)E \supset (\iota xxg)\text{ass}$, by the assumption of existence-controlled relaibility.

Second case: There are two ways in which an existentially-loaded descriptor may be defined in the framework given. Firstly, an intermediate descriptor II which requires existential loading but does not demand existential uniqueness may also be defined, thus: $\text{II}xA(x) =_{\text{Df}} \iota x(xE \,\&\, A(x))$. In terms of this descriptor, $\vdash (\text{II}xxg)f \equiv (\exists y)(yg \,\&\, (Uz)(zg \supset. z = y) \,\&\, yf)$, provided $(\text{II}xxg)$ass & f ref. For

$$(\text{II}xxg)f \equiv \iota x(xg \,\&\, xE)f$$

$$\equiv (Py)(yE \,\&\, yg \,\&\, (z)(zE \supset. zg \supset. x = y) \,\&\, yf) \qquad \{\equiv\text{RHS}\},$$

under the provisos. Thus the intended form of (β) results, subject to two interesting qualifications. But the descriptor II has little more than formal interest, since anyone who really wants to insist upon existential loading will also insist upon existential uniqueness, i.e. uniqueness among existing objects. So results the existential definite descriptor I_L, defined, using Leibnitz identity: $I_L xA(x) =_{\text{Df}} \xi x((\forall z)(A(z) \equiv. z \approx x)$. Other identity determinates are almost always more appropriate, but I_L makes the comparison with Russell's theory easier. For then

$\vdash (I_L xxy)f \leftrightarrow (\exists z)(zg \;\&\; (\forall y)(yg \supset. \; y \approx z) \;\&\; zf)$, provided only $(I_L xxg)$ass. A similar second analogue of (α) can be obtained, namely in the result $\vdash (I_L xxy)E \leftrightarrow (\exists y)(yg \;\&\; (\forall z)(zg \supset. \; z \approx y))$, without provisions. The assumption under which (β) is established, viz. $(I_L xxg)$ass is however a large one, which frequently enough would be wrong. It is best avoided. It is in fact a product of the excessive existential requirements incorporated in Russellian theory and can be escaped in theories which (rightly) demand less. The proper comparison of neutral description theory is really not with classical description theory, but with free description theory where the erroneous existence (and identity) assumptions of classical theory have been to some extent removed.

4. Derivation of minimal free description logic and of qualified Carnap schemes. Deriving minimal free description theory is primarily a matter of deriving the basic scheme for free descriptor I, namely

FDL. $(\forall y)(y = IxA \equiv. \; A(y) \;\&\; (\forall z)(A(z) \supset. \; z = y))$.

The only art in deriving FDL lies in choosing an appropriate definition of descriptor I. But in fact the consideration of §14 guide the choice of definition completely. For we already know that $IxA(x)$, understood as 'the x such that A(x)' will have a definition of the form: an unique x such that A(x); and we know that in free logic (where a guiding principle has been Quine's: to be is to be the value of a bound variable) all bound variables are existentially-loaded, and that the uniqueness requirement is one of existential uniqueness (see the discussion of 'the red-headed man' in §14). Accordingly, as before

$$IxA(x) =_{Df} \xi x(xE \;\&\; A(x) \;\&\; (\forall z)(A(z) \supset. \; z = x)).$$

The existentially-loaded descriptor I may be read 'the existent' or 'the actual'. There is one remaining indeterminacy to settle before FDL is derived, namely what identity determinate is involved in FDL and in the definition of I: is it Leibnitz identity or extensional identity? In fact early free logic almost invariably adopted Leibnitz identity, but some more recent theories have toyed with use of extensional identity. It costs little to consider both cases:

a. The identity determinate is Leibnitz-identity $\approx$. There are two cases in proving the biconditional FDL.

Case 1. Suppose yE and $y \approx IxA$: To show $(\forall z)(A(z) \equiv. \; z \approx y)$. By identity principles, $(IxA)E$. Hence, by ECP, $A(IxA)$, whence expanding using the definition of I, $(\forall z)(A(z) \supset. \; z \approx IxA)$. Hence as $y \approx IxA$, $A(y) \;\&\; (\forall z)(A(z) \supset. \; z \approx IxA)$.

Case 2. Suppose $yE \;\&\; A(y) \;\&\; (\forall z)(A(z) \supset. \; z \approx y)$: abbreviate this wff as $C(y)$. By the ξ scheme, $C(\xi yC)$ (subject to usual variable provisos), i.e. $C(IyA)$. Hence, expanding the scheme, $(IyA)E \;\&\; A(IyA)$. By the last conjunct of the hypothesis, $(IyA)E \;\&\; A(IyA) \supset. \; IyA \approx y$. Hence, detaching, $y \approx IxA$, as required.

b. The identity determinate is extensional identity. Case 2 is as before, but case 1 is modified. Firstly, the step from yE and $y = IxA$ to $(IxA)E$ uses the transparency of E. Secondly, and more important, the step to $A(y)$ from $A(IxA)$ and $y = IxA$ requires that $A(x)$ be extensional. Thus FDL becomes subject to the proviso that A(x) be extensional.

The underlying free logic, free quantification logic with identity, follows as before in neutral theory; and $IxA(x)$ is a well-behaved term where $A(x)$ is a free wff. For, in particular, $\vdash (IxA(x))E \supset. (\forall y)B \supset B(IxA(x)/y)$. [cf. also PM, *14.18].

Qualified versions of Carnap's core scheme for theories of descriptors follow using FDL, as in §14. In particular, where identity is Leibnitzian, if $(IxA)E$, then $B(IxA) \equiv (\exists y)[(\forall x)(A(x) \equiv x \approx y) \;\&\; B(y)]$. A similar scheme holds where the identity determinate is extensional, subject however to the proviso that A and B are extensional.

5. An initial comparison with Russell's theory of indefinite descriptions.

Russell's theory of indefinite descriptions, of the article 'an' can likewise be taken to consist of two theses, in this case

(γ) An item which is g exists iff there exists something which is g; what can be re-presented neutrally as $(\xi xxg)E \equiv. (\exists x)xg$.

(δ) An (actual) x which is g is f iff there exists an item which is g and f, what can be represented neutrally as $(\xi xxg)f \equiv (Px)(xg \;\&\; xf)$, or better, in existentially-loaded form, as $(\epsilon xxg)f \equiv (\exists x)(xg \;\&\; xf)$.

The thesis makes it plain, first of all, that 'an' is being construed as 'some or other' or (differently) 'an arbitrary', not as 'a certain' or 'an already selected'. For in the latter case that there exists a g would not guarantee that the certain or select g does, only some other may. The appropriate descriptor to consider then in this comparison is a descriptor that behaves logically like ξ (or versions of it, such as existentially-loaded versions). The symbolism adopted reveals that there is room for the same sort of vacillation between existentially-loaded and existence-free indefinite descriptions as occurs in the case of definite descriptions. Attempts to rationalize the matter by using ξ uniformly founder. For then though one half of (γ) derivable and correct, (δ) $(\xi xxg)f \equiv (Px)(xf \;\&\; xg)$,[1] is false. On the other hand, should we endeavour to use ϵ uniformly, then though (γ')$(\epsilon xxg)E \equiv. (\exists x)xg$ is correct, (δ') is only provisionally correct. But the attempts indicate, what other evidence confirms, that the loaded descriptions are the classically intended ones: they are commonly not the ordinarily intended ones, as we have seen.

Not both (γ) and (δ) can be expected to emerge universally valid in the logic of items, because, once again, the logic includes principles like - $(Ux)xh \supset. (\xi xxg)h$ and $\xi xxh = \xi xxh$ - and similarly for ϵ - inconsistent with Russell's (unformalised) theory of indefinite descriptions. The following properly qualified forms result in the theory of items:

$$\vdash (\epsilon xxg)E \equiv (\exists x)xg, \text{ i.e. } \xi x(xg \;\&\; xE)E \equiv. (Px)(xg \;\&\; xE).$$

$$\begin{aligned} \text{For } \xi x(xg \;\&\; xE)E &\supset. \xi x(xg \;\&\; xE)\text{ass} \\ &\supset. \xi x(xg \;\&\; xE)E \;\&\; \xi x(xg \;\&\; xE)g \\ &\supset. (Px)(xg \;\&\; xE) \end{aligned}$$

$$\begin{aligned} \text{Conversely } (Px)(xg \;\&\; xE) &\supset. \xi x(xg \;\&\; xE)g \;\&\; \xi x(xg \;\&\; xE)E \\ &\supset. \xi x(xg \;\&\; xE). \end{aligned}$$

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[1] Similarly the equivalence with $\exists$.

The strict equivalence, $\vdash (\epsilon xxy)E \leftrightarrow (\exists x)xg$, is similarly derivable. This can no more be regarded as providing an analysis of existence than the corresponding principle for definite descriptions. For such a connection would use E in order to define it, since it amounts to $\vdash (\epsilon xxg)E \leftrightarrow (Px)(xE \;\&\; xg)$. Essential use is made of the existential quantifier, a corresponding connection failing with neutral quantifiers. Classical theory in the style of Russell will have to look elsewhere for a noncircular account of existence.

$\vdash \xi x(xg \;\&\; xf)f \equiv. (Px)(xg \;\&\; xf)$, provided $\xi x(xg \;\&\; xf)$ass.

The proof generalises on the preceding proof.

$\vdash (\xi xxg)f \supset (Px)(xg \;\&\; xf)$, provided (ξxxg)ass.

$\vdash (\epsilon xxg)f \supset (\exists x)(xg \;\&\; xf)$, provided (ϵxxg)ass.

$\vdash (\exists x)(xg \;\&\; xf) \supset \epsilon x(xg \;\&\; xf)f$.

6. Other indefinite descriptions: 'some', 'an' and 'any'. Are these analogues of Russell's principles strong enough: shouldn't

Σ. $(Px)(xg \;\&\; xf) \supset (\xi xxg)f$, be a theorem?

No, it is not valid. For consider

Σ'. $(Px)(xrd \;\&\; x{\sim}rd) \supset (\xi xxrd){\sim}rd$, and

Σ''. $(Px)(xrd \;\&\; xred) \supset. (\xi xxrd)red$.

In each case the antecedent is true, e.g. the antecedent of Σ' is vindicated by Meinong's round square. But the consequences are not true in general. For $\xi xxrd$, on its intended interpretation, selects from the class of items an item a which is round. The item a picked out may not be non-round and it may not be red; for some round items exist and it is false of some round items that they are red. In this argument resort is had to the intended interpretation of the ξ-symbol as a choice function over subclasses of the class of all items.

An article 'some' - often replaceable by 'any' - with precisely this role certainly occurs in English (see OED); and it is of this 'some' or 'an' that a neutral formalisation has been attempted. But other 'some''s than the choice 'a' also occur in English (see OED; and for an attempt to sort some of these out, see Russell's earlier work, especially 37, and also Geach 62). Most important among these is the unspecified (and perhaps unknown) particular, as in 'some fool has locked the door' (OED), where 'some' can be filled out 'a particular'. 'A certain' is different, suggesting that the particular, although it is not being specified, is known. The ambiguous-value 'a', read approximately 'some or other', differs from 'a certain'; but many of the unspecified particular cases are of the ambiguous-value sort. The basic linguistic test, of course, is whether 'some' and 'a' can be suitably replaced by 'some ... or other'. For instance, in 'Spogmorth suspects a plumber' the 'some or other' test typically fails.

The logic of a certain or a definite, symbolised κ, is essentially the same as that of names, and the theory is similar: a certain makes a specific nonarbitrary selection. 'A certain' is rather like 'Bill', only the specification is not restricted, e.g. to Bills; it could not too inaccurately be called an unrestricted variable proper name. The selection, which has to be made, and should be fixed for the given context, is contextually determined. Members of the audience may well not know the selection, and the speaker may be none too clear to the object selected or even whether it exists. As well as delimiting the selection, context may supply existence assumptions; and it may not. Where the logic, like neutral logic so far developed, does not take account of context, the logical theory of κ reduces to the following formation rule:

Where A is a wff (characteristically retaining u free), κuA is a (full) subject term. There are no characterising axioms: in a way *that* is what is distinctive (in a framework which admits only singular terms) about κ.

The logic of *some (or other)*, symbolised σ though usually reckoned to be straightforward, has its problems (as we saw in §16). The usual assumption is that σ can be eliminated in favour of the particular quantifier. But, even if $B(\sigma xA)$ could be generally replaced by $(Px \ni A)B$, the further replacement resulting in $(Px)(A \& B)$ is decidedly doubtful, as is now shown.

7. *Further comparisons with Russell's theory of indefinite and definite descriptions, and how scope is essential to avoid inconsistency.* Nothing however appears to stop the introduction of a formal descriptor, σ^*, *like some (or other)* but which is invariably eliminable in terms of *P* (or $\exists$), i.e. for which (Σ) does hold. That is, σ^* is a simple descriptor, subject to the following axiom scheme:

Σ^*. $B(\sigma^* xA) \leftrightarrow (Px)(A \& B)$.

Since Σ^* yields immediately the thesis, $\vdash (\sigma^* xxg)E \leftrightarrow (\exists x)xg$, σ^* obviously approximates better to Russell's indefinite descriptor than ξ. And an existentially-loaded version of σ^*, defined thus: $\zeta xA = \sigma^* x(xE \& A)$, appears to correspond exactly. For $\vdash (\zeta xA)xy \leftrightarrow (\exists x)xg$ and $\vdash (\zeta xxg)f \leftrightarrow (\exists x)(xg \& xf)$, i.e. γ) and δ) rewritten.

Unfortunately for this proposal Σ^*, invariant though it may appear, rapidly leads to inconsistency and thence triviality. Precisely the same would happen also to Russell's principle (δ) *were* it stated generally or - what one would expect to be legitimate - the rule of substitution applied to it to yield the scheme: $B(\text{an } x\ A) \equiv (\exists x)(A \& B)$. To show how σ^*, leads to collapse let C abbreviate $(B \& {\sim}B)$ and consider ${\sim}C(\sigma^* xC)$. By Σ^*, ${\sim}C(\sigma^* xC) \equiv (Px)(C \& {\sim}C)$. But ${\sim}(Px)(C \& {\sim}C)$, hence $C(\sigma^* xC)$, whence, by Σ^* again, $(Px)(C \& C)$, i.e. $(Px)C$, i.e. $(Px)(B \& {\sim}B)$, contradicting ${\sim}(Px)(B \& {\sim}B)$. Triviality follows then by paradox principles.

The trouble, as Russell saw it, is that two different scopes have been ascribed to the description in ${\sim}C(\sigma^* xC)$, scopes which may be distinguished thus: $[\sigma^* xC]\ {\sim}C(\sigma^* xC)$ and ${\sim}[\sigma^* xC]\ C(\sigma^* xC)$. The inconsistency, and similar inconsistencies in unscoped versions of Russell's theory of definite descriptions are removed by writing the scope of a description into its definition or characterising axioms. But to say that a description has scope is to say that the descriptions depend, among other things, on the wff (or propositional function) that it applies to; and to say this is really to say that such descriptors are not simple operators but binary ones, that what should have been defined instead of $\sigma^* xA$ in Σ^* is the unscoped $\sigma^* x(A, B)$, with B showing the wff σ^* applies to, i.e. in effect the scope.

Neutral theories of both sorts, with scope and, most satisfactorily, using binary descriptors can readily be devised, e.g. by simply reexpressing Russell's scoped theories in neutral terms or by recasting them in terms of binary descriptors (cf. SE). Naturally theories of definite descriptions result in this way as well as theories of indefinite descriptions. Indeed much as different accounts of uniqueness tend to lead to different theories of definite descriptions, so different theories of indefinite descriptions typically furnish different theories of definite descriptions. The connection is of course the one we began with: that *the* is *an unique*.

8. *The two (the) round squares: pure objects and contextually determined uniqueness.* In natural language the uniqueness of a description is usually contextually determined: such was the conclusion reached in §14, p.140 (which the present discussion continues). This happens with nonentities as well as entities: the red-headed man indicated may be the hero of a novel or the villain of a film. Whether he exists or not he will typically have many other features than being red-headed and a male human. He will be of a certain height, age, weight, temperment, etc. By contrast, the pure object, the red-headed man will not; it will have no other features, except perhaps those its characterisation implies. Thus we can distinguish

(a) pure or completely-specified objects, such as the (pure) round square, which is just round and square, and (so) has no other extensional features.[1] Of course it has other features, derivatively so to say, e.g. it is unique, you're thinking about it, etc.

(b) Incompletely-specified or ordinary objects, such as the round square which is also blue and quite small.

When definitely-described objects of sort (b) do not exist, difficulties with the uniqueness condition imposed for definiteness (often problematic even in the case of entities) is, as was shown, much accentuated - in part because of the sheer numbers of nonexistent objects of any given sort. The problem may be solved, it seems, in the same way as, and at once with, the problem of contextual specification of uniqueness. The proposed solution has two parts, one corresponding to $D\iota 2$, which adds a contextual clause, and one corresponding to $D\iota 3$ which appropriately complicates selection procedures. As to the first, a further qualification is imposed on the uniqueness clause, as follows:

$D\iota 2^c$. $\iota xA =_{Df} \xi x(A \;\&\; (z)(A^c \supset. \; z = y))$,

where A^c adds to A a further condition to the effect that z belongs to the indicated context. The uniqueness clause may be alternatively written $(z \ni C)(A \supset. \; z = y)$. The context of ιxA supplies a predicate (or class) C restricting the range within which uniqueness is claimed or asserted.

Other expected results and qualifications then follow from $D\iota 2^c$, much as in section 2 and 3. For example, it follows that ιxA exists iff there exists a contextually unique x such that A, e.g. $\vdash (\iota xxg)E \rightleftarrows (\exists y)(yg \;\&\; (z \ni C)(zg \supset. \; z = y))$. Proof jazzes up the argument given in 2.

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[1] This is not Meinong's use of 'pure', in which the pure object is one of *Aussersein*, it is pure in standing beyond being and nonbeing. Perhaps, a better term than 'pure' can be found for such archetypal objects as the round square.

But $D\iota 2^c$ does not reflect well how we make further selections when the full condition fails, i.e. $\sim(Px)(A \;\&\; (z)A^c \supset.\; z = y)$. Consider the case where it is said 'The red-headed man is gorging himself on meat pies again', where there are two red-headed men in the indicated context. What we don't say is that no statement is made, the claim is illdefined, it's truth-value doesn't arise, or it's false. What we say rather is 'Which one?'. We request, or make, a further selection within red-headed men in the indicated context. Hence the second part of the proposal, which expands $D\iota 2^c$ to

$$D\iota 4^c. \quad \iota xA =_{Df} \begin{cases} \xi x(A \;\&\; (z)(A^c \supset.\; z = y)) & \text{where the full condition is met; and} \\ \xi xA \text{ otherwise.}[1] \end{cases}$$

Observe that the same sort of recipe will work for definitely described pure objects, only now the "context" is considerably narrowed, to those items with just A's presented features. There are various sorts of pure objects to deal with; for example

P1. A simple case where the described object has only ch features.

P2. The object presents itself as having nonch features, e.g. 'the existent round square', but the description may include much more elaborate predicates (which however can be contracted by abstraction axioms).

P3. The object has features implied by the features it is described as having. Strictly this case can be assimilated under P2; etc.

Consider P1, with ιxA. By HCP and extensionality conditions there is a unique object z such that A(z). Then ιxA is z. With P2 presented features should presumably be taken into account; e.g. the (pure) existent round square is round and square and s(existent). Again there is a unique object with these features which the description signifies.[2] A first stab at a more comprehensive definition might well go as follows:

$$\iota(\text{pure})xA =_{Df} \begin{cases} \xi x(x \text{ satisfies } s(A) \text{ and no more uniquely}); & \text{otherwise} \\ \xi xs(A). \end{cases}$$

9. Solutions to Russell's puzzles for any theory as to denoting. Solutions to the three puzzles (presented in OD, pp.47-8), which Russell claimed 'a theory as to denoting ought to be able to solve', are easily reached. These solutions are outlined here for the simple reason that Russell and many

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[1] It could be argued that this is the beginning of a slippery slide. For consider the case where there is no red-headed man in the indicated context. It would, perhaps, be pointed out to the speaker: you made a mistake, you meant something else, some other person. Very likely a tolerant listener would make some other selection, probably among pie-gorging men. Such a selection, would violate desirable recursive features; but a further selection among men would not, though it would involve some technical difficulties. And so the selection proceeds outwards through categorially more comprehensive classes until it stops, at the class of all objects.

[2] There is one trick here: the (pure) s(existent)rs = the (pure) existent rs. But proving the identity requires a principle discussed later (see 7.9).

successors take them to be puzzles for the logic of descriptions; it should be observed, however, that the resolutions do not depend crucially on a particular theory of descriptions at all.

Puzzle (1) is caused by the adoption of Leibnitz's definition of identity. It is solved through use of extensional identity. For puzzle (1) is the following intensional paradox:

(a) George IV wished to know whether Scott was the author of Waverley.

(b) Scott was the author of Waverley.

Applying Leibnitz's identity principle it follows, what is false,

(c) George IV wished to know whether Scott was Scott.

But the sentence predicate 'George IV wished to know whether ...' is neither extensional nor modal while the identity (b) is a merely extensional identity. Hence (c) does not follow from (a) and (b). (a) and (b) are true but (c) is false. The solution turns only on the theory of identity, not on the theory of descriptions.

Puzzle (2) is undercut by rejecting the premiss on which it is based, that, by LEM, either 'A is B' or 'A is not B' must be true. As on Russell's theory neither 'The present king of France is bald' nor 'The present king of France is not bald' is true. But sentence LEM is not thereby violated; 'It is not the case that the present king of France is (not) bald' is true.

Puzzle (3) is this: how can a nonentity be the subject of a proposition? But there is no reason, bar bad ones such as the Ontological Assumption, why the subject of a sentence must designate something actual. If A and B, for example, do not differ then

(d) The difference between A and B does not exist,

expresses a truth. Thus 'the difference between A and B' signifies (in the wide sense) a nonexistent item (of higher order). There is no inconsistency in asserting that a nonexistent item does not exist; for in such existence denials the subjects do not carry ontological loading. In contrast,

(d') (The difference between A and B)^E does not exist,

expresses not a truth but a logical falsehood. But (d) is quite distinct from (d'). The difficulties raised by existence denials disappear when neutral subject terms, i.e. terms which do not carry ontological weighting, are used.

§23. *Widening logical horizons: relevance, entailment, and the road to paraconsistency and a logical treatment of contradictory and paradoxical objects.* No logic is satisfactory without a good implication relation: implication and deducibility are at the heart of logic (see RLR, chapter 1). Yet the logics relied upon so far, classical and strict systems, contain only poor approximations to a good implication, namely the paradox-ridden material and strict connections.

1. The importance of being relevant. The full and powerful case for a relevant implication - which being relevant is paradox-free, that is avoids all the variants upon the paradoxes of implication - is detailed in companion works (notably RLR, but see also UL appended), wherein is documented the extent to which systematic paradoxes and puzzles across wide areas of philosophy are engendered by starting out with a faulty irrelevant implication and how also the puzzles concerned are removed by switch to a good implication.

Two other examples:- First, it is important for certain philosophical purposes to define a notion of logically necessary existence, to define 'the existence of a depends logically on the existence of b'. Hinckfuss 76, who explains some crucial roles intended for the notion, shows that there are serious difficulties however in explicating the notion in terms of classical and modal apparatus, specifically in terms of strict implication and Russell's theory of descriptions. But in neutral logic with entailment, explication is unproblematic. The existence of a depends logically on the existence of b iff aE ⇒ bE, that a exists entails b exists. Hinckfuss's response (p.125) to this point does not pass muster:- 'Logicians and philosophers are not agreed on what such a stronger notion of entailment amounts to' - that test would remove most notions of importance - 'or even whether or not a full and consistent explication of some stronger notion of entailment is possible' - but such explications are not in doubt. Second, more to the point, strict implication induces several undesirable - not to say mistaken - results in the theory of objects itself. One example from Parsons' 1978 theory, which parallels Lewis's crazy result that there is (with strict equivalence giving identity) just one impossible proposition, is this: there is just one impossible object which is deductively closed.

It is especially important, in any logic designed to provide a decent account of nonexistent objects and of intensional relations, to have available tight relations of implication and entailment, i.e. logical necessary implication. For slack connections, such as material and strict implications, fudge distinctions and commonly lead, if taken with due seriousness, to undesired, sometimes highly undesirable, consequences. The really damaging effects of these classical connections[1] (strict is effectively classical when construed metalogically in terms of valid material implication) appear most strikingly where inconsistency figures, where inconsistent objects of inconsistent situations are under investigation. However the damaging effects are in fact much more widespread and occur where inconsistency does not figure, in particular where intensionality matters (see UL).

Classical theories, classical logics and their extensions, such as modal logics prevent the consideration of distinct inconsistent situations. The situation where a semantical paradox is enacted is the same as a situation where the (external negation) round square is both round and such that it is not the case that it is round (i.e. (rs)r & ~(rs)r); both collapse into the trivial situation, the one classical inconsistent situation, where everything holds. This is at serious variance with the facts. The collapse of different inconsistent situations to triviality is due basically to paradoxes of implication which spread any inconsistency, including relatively isolated ones, everywhere, i.e. to the principles

$A \,\&\, {\sim}A \supset B$ (ex falso quodlibet); $A \,\&\, {\sim}A \dashv B$ (ex impossibile quodlibet).

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[1] If classical relations such as material implication, can be so called. In traditional terms, material implication provides not an connection but rather an accidental "conjunction".

Such collapse effects are however removed with appropriate introduction of relevant implication.

It is evident then that no classical theory can provide a proper theory of radically inconsistent objects which have contradictory properties. *That is why such objects are variously said to be beyond the scope of logic, illogical, incorrigible*, and so on - *when the basis for these claims is merely that they are beyond the narrow scope of classical theory*, are classically illogical, etc. At best within classical theory there can be approximations to radically inconsistent objects by way of predicate negation and its variants, such as internal property negation.

The way classical theory treats of - or rather *fails* to treat - inconsistency represents but the tip of the iceberg. It is simply that the effects where inconsistency is not directly involved are a little less blatant (otherwise too classical logic would not have enjoyed the amazing, and undeserved, inside running it has had).

A good logic will include then a good implication, ideally a relevant implication, $\to$, which can be interpreted as a sufficiency relation, so that $A \to B$ may be read: A is sufficient (on its own) for B, i.e. the relation is not enthymematic and does not suppress assumptions that are made (as e.g. intuitionistic and "minimal" implication do). If $\to$ is not a logical relation then a good logic will include also an entailment relation $\Rightarrow$, which may be defined $A \Rightarrow B =_{Df} \Box(A \to B)$, i.e. entailment is logically necessary implication, and represents logical sufficiency. Thus $\Rightarrow$ supplants strict implication as $\to$ supplant material.

2. *Zero-order and quantified relevant logics: syntax and semantics*. A detailed account of relevant logics is presented in the companion volume RLR. Here then only some of the theory will be lightly sketched (more will be found in UL, appended). The vocabulary of the simpler systems differs from that of SQ or Q only by the addition of the primitive connective $\to$ which conforms to the rule: if A and B are wff, so is $(A \to B)$. Less simple systems (studied in RLR) add $\Rightarrow$ or $\Box$ as well and perhaps other connectives. Let us suppose that $\to$, $\sim$, & are taken as primitive connectives. Further connectives are defined: in particular $A \vee B =_{Df} \sim(\sim A \mathbin{\&} \sim B)$; $A \leftrightarrow B =_{Df} (A \to B) \mathbin{\&} (B \to A)$; $A \supset B =_{Df} \sim(A \mathbin{\&} \sim B)$.

The postulates of the basic zero order relevant system BSQ are as follows (B is studied in RLR, chapter 3, where its theorems and nontheorems, virtues and limitations are pointed out BQ is investigated in Routley 79a):-

Sentential schemes: $A \to A$; $A \mathbin{\&} B \to A$; $A \mathbin{\&} B \to B$; $(A \to B) \mathbin{\&} (A \to C) \to. A \to (B \mathbin{\&} C)$; $A \mathbin{\&} (B \vee C) \to. (A \mathbin{\&} B) \vee (A \mathbin{\&} C)$; $A \to \sim\sim A$; $\sim\sim A \to A$.

Inference rules: $A, A \to B \rightarrowtriangle B$; $A, B \rightarrowtriangle A \mathbin{\&} B$; $A \to B, C \to D \rightarrowtriangle B \to C \to. A \to D$ (Affixing); $A \to B \rightarrowtriangle \sim B \to \sim A$.

The quantificational schemes, added to get from BSQ to BQ, are essentially the same as those of S2Q, namely:

Quantificational schemes: $(x)A \to (A(t/x)$, for any term t; $(x)(A \to B) \to. A \to (x)B$, where x is not free in A; $(x)(A \vee B) \to. A \vee (x)B$, where x is not free in A; $(x)(A \to B) \to. (Px)A \to B$, where x is not free in B, and P is defined as usual (i.e. $(Px)A =_{Df} \sim(x)\sim A$); $A \rightarrowtriangle (x)A$.

The main interest lies in systems that are stronger than B (and BQ), but not too much stronger; for example not nearly as strong as the main systems studied in Anderson-Belnap 75, but in the vicinity of systems DL and DK (of UL and DLSM), obtained by including such principles or Contraposition and Excluded Middle.

Perhaps more illuminating than the syntactical systems is the semantical theory, which is noneist in character. The too-narrowly-circumscribed class of complete possible worlds of modal semantics is expanded enormously to include both impossible worlds and incomplete worlds. The modal restriction to complete possible worlds is obviously a mistake when the object is - as Lewis's object in formulating modal logics was - to capture the theory of deducibility. For deducibility is not limited to complete worlds or possible worlds. The class of deductive worlds is far wider than those modal semantics considers. An impossible (or inconsistent) world is one where some statement A and its (external) negation ~A both hold; an incomplete world is one where for some statement A, neither A nor ~A hold. It is evident that classical evaluation rules for negation break down for inconsistent and incomplete worlds (though students brainwashed in classical theory appear to have great difficulty in appreciating this elementary fact). For if both A and ~A hold in world b, a rule like the classical rule which tells us that, as ~A holds in b, A does not hold in b is automatically in doubt, and faulted on reflection. Similarly if neither A nor ~A hold in c a rule like the classical one which insists that one or other of them holds in c is defective.[1] Accordingly a rule that is a little less crude than the classical evaluation rule for negation is required to evaluate negation once the class of worlds is duly expanded to include all deductive situations. A more sophisticated rule, without classical defect, can be obtained by considering reverse situations. The reverse a^* of world a, the world such that whatever A, if ~A holds in a then A does not hold in a^*. (A reverse world is like the reverse side of something, e.g. a gramophone record.)

Apart from operation * the elements of a BQ model differ from those of an S2Q model only in replacing two-place relation R by a three-place relation, the latter being essential if the irrelevance of strict implication is to be removed. But for certain extensions of BQ a further subclass O of K is required: O is the set of all regular worlds, those worlds where all theorems hold. A BQ model M is accordingly the structure $M = \langle T,O,K,R,*,D,I\rangle$ where $T \in O \subseteq K$, R is a 3-place relation and * a 1-place operation on K, D is a (nonnull) domain of objects, and I an interpretation function. Apart from I, M is constrained for every $a,b,c,d \in K$ by the following conditions, in which $a \leqslant b =_{Df} (Px)(Ox \;\&\; Rxab)$:-

p1. $a \leqslant a$

p2. If $a \leqslant d$ and Rdbc then Rabc.

p3. $a = a^{**}$

p4. If $a \leqslant b$ then $b^* \leqslant a^*$.

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[1] For related reasons classical negation, evaluated classically, is neither the determinable negation of English nor the principal determinant. The assumption that classical negation is the negation of natural language is a largely unexamined, and quite defective, assumption: see RLR, chapter 2. Classical negation is a fairly natural, but nonetheless illegitimate, extrapolation from the restricted otherness connection, which is the principal negation determinant.

Interpretation I is a function which assigns to each subject term t (i.e. subject variable or constant) an element I(t) of D, to each n-place predicate parameter f^n at each world a of K, an n-place relation on K (extensionally, a subset of K^n), and to each sentential parameter p at each a in K exactly one of the values {1, 0}; subject always to the constraints for a and b in K:

(1) if $a \leqslant b$ and I(p, a) = 1 then I(p, b) = 1, and

(1') if $a \leqslant b$ then $I(f^n, a) \subseteq I(f^n, b)$.

Interpretation I is extended generally to all wff as follows: $I(f(t_1,\dots,t_n), a) = 1$ iff $<I(t_1),\dots,I(t_n)> \iota\, I(f^n, a)$, i.e. iff the interpretations of terms $t_1,\dots,t_n$ instantiate the relation assigned to n-place predicate f^n at world a; I(A & B, a) = 1 iff I(A, a) = 1 = I(B, a); $I({\sim}A, a) = 1$ iff $I(A, a^*) \neq 1$; $I(A \rightarrow B, a) = 1$ iff, for every b and c in K, if Rabc and I(A, b) = 1 then materially I(B, b) = 1; I((Ux)A, a) = 1 iff $I^x(A, a) = 1$ for every x-variant I^x of I, where I^x is an x-variant of I iff I^x differs from I at most in assignments to x (the *elementary* rule).

The main semantical notions, defined are just as for S2Q. That is, generalising, a wff A is *true in* M just in case I(A, T) = 1, and *false in* M otherwise. A is *LQ-valid* iff A is true in all LQ models, and *invalid* otherwise. A set Δ of wff is LQ *simultaneously satisfiable* iff for some LQ model M, every wff A in Δ is true in M. The adequacy of the semantics, in particular that theorems and only theorems are valid, is shown along the lines of Routley 79a. As in the modal case, extensions of BQ are modelled by adding conditions to the semantics for BQ. Three examples:

Axiom scheme	Modelling condition
$A \vee {\sim}A$	$x^* \leqslant x$ for $x \in 0$
$A \,\&\, (A \rightarrow B) \rightarrow B$	Raaa
$(A \rightarrow B) \,\&\, (B \rightarrow C) \rightarrow A \rightarrow C$	if Rabc then for some x in K Rabx and Raxc

In systems which correctly include LEM, $A \vee {\sim}A$, that is in extensions of GQ (G = B + [$A \vee {\sim}A$]), only "normal" or classical models are required, where a model structure is normal if $T = T^*$. But for dialectical applications, where both A and ~A hold for some A, such a classical condition cannot be imposed.

3. *Object-theoretic elaboration of relevant logic*. As base logic some fairly minimal extension of GQ will be chosen (e.g. some system in the vicinity of DKQ of UL). To render the logic adequate as a logic of items it will have to be much enriched, in a way parallel to the progressive enlargement of neutral modal logic already presented. Some of the enrichment is straightforward, some is not (as explained in 5 below). Among the more straightforward pieces are these:-

Predicate and internal negation. The logic of predicate negation can be directly transferred from modal logic to relevant logic, the double negation axiom becoming $\underset{\sim}{t}{\sim}{\sim}f \leftrightarrow \underset{\sim}{t}f$. The semantics are as before, but they can alternatively be neatly combined with those for internal negation. Furthermore internal negation can be seen as extending predicate negation, the axiomatic connection being: where A is of the form $\underset{\sim}{t}f$, $\vdash \overline{\underset{\sim}{t}f} \leftrightarrow \underset{\sim}{t}{\sim}f$.

How internal negation *is* evaluated turns on whether it conforms to a contraposition rule, $A \rightarrow B \twoheadrightarrow \overline{B} \rightarrow \overline{A}$, or not.

If it does, and so induces a corresponding *rule* for predicate negation, then

$$I(\bar{A}, a) = 1 \text{ iff } I(A, a^{\dagger}) \neq 1,$$

where † is an operation on K such that $a^{\dagger\dagger} = a$ and if $a \leqslant b$ then $b^{\dagger} \leqslant a^{\dagger}$. If it does not then a more complex semantical rule of the type considered in §24 is one alternative. (Full details of both sorts of cases are presented in RLR, chapters 7 and 8).

Existence and possibility predicates may be introduced as in the neutral-modal presentation.

Second-order relevant logics. Syntactical details resemble those in the modal case. For 2GQC substitution and other schemes are liberalised to admit predicate and sentential schemes. For 2GQ, abstration with ↔ as the main connective is also added, i.e. the relevant formulation is

$$(\mathrm{P}f)(\underset{\sim}{x})(\underset{\sim}{x}f \leftrightarrow A), \text{ with } f \text{ not free in } A.$$

Semantical analysis too parallels the modal case. So also does the introduction of λ abstracts, given (what is problematic) that identity of predicates is defined as in the modal case.

Characterisation postulates. Such principles as HCP which avoid ξ can be introduced forthwith, again with ↔ as main connective, i.e. the relevant formulation is

$$(\mathrm{P}x)(\mathrm{ch}f)(xf \leftrightarrow A), \text{ with } x \text{ not free in } A.$$

Similarly for KCP.

4. *Relevant paraconsistent logics, and radically contradictory and paradoxical objects.* A logic L is *paraconsistent* iff for some theory S for which L is an underlying logic (i.e. S includes all axioms of L and is closed under the rules of L), S is (simply) inconsistent but nontrivial, i.e. for some wff A both A and ~A hold in S but not every wff holds in S.[1] That is, paraconsistent logics are logics which have nontrivial inconsistent extensions; and so they include narrowly paraconsistent, or dialectical logics, i.e. nontrivial inconsistent logics. A *putatively paraconsistent* (pp) logic or theory is one which is inconsistent and putatively nontrivial.

Relevant logics which do not include the rule γ of Material Detachment (i.e. A, ~A ∨ B – B) are paraconsistent logics. Though relevant logics by no means exhaust paraconsistent logics, they are the most satisfactory paraconsistent logics (so it is contended in DLSM). No logic (with normal conjunction and disjunction) including γ or the central paradoxes of implication, such as A & ~A → B, is paraconsistent. For these principles trivialise any inconsistent extension. But relevant logics were precisely and carefully fashioned to avoid such paradoxes while ruling out no valid arguments (this contentious thesis is defended in RLR). Rival irrelevant paraconsistent logics characteristically weaken the negation logic and so do rule out intuitively valid arguments (e.g. full double negation principles or forms of contraposition).

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[1] Strictly this defines paraconsistency of L wrt negation ~. For a fuller account, and a valuable survey of paraconsistent logics, see Arruda 79.

Relevant logics without γ, such as BQ, leave it open whether the actual world T (of the semantical theory) is consistent or not. The thought soon occurs to anyone who has struggled with paradoxes, especially such apparently true contradictions as those the logico-semantical paradoxes yield, that perhaps the world is not consistent. And if it is not then the paradoxes can simply be accepted, not as "paradoxes" any longer, but as involving valid reasoning and as yielding isolated "true contradictions". One of the really big attractions of certain paraconsistent logics[1] is that having adopted them (as underlying logics) one can apparently forget about complicated restrictions on or replacements for abstraction principles and the like (i.e. on CPs of higher order: see 5) in order to avoid logico-semantical paradoxes. Abstraction principles can be formulated in their intuitive ("naive") forms without order, types, separation, stratification, or other restrictions, and attribute abstracts (as introduced in 1.18(4)) can be freely admitted to subject places.

With the paraconsistent assimilation of the paradoxes (as further explained in UL appended) can go much desirable simplification in logical theory. Not only can abstraction principles revert to intuitive forms, but much auxilliary apparatus - not part of natural languages, but designed to shield formal languages from the effects of the paradoxes (while conveniently admitting reduced versions of these as "deep" limitative theorems) - can be largely jettisoned, e.g. language and type hierarchies, levels of language theories, and exaggerated insistence on use mention distinctions.

A corollary of the paraconsistent neutralisation of the paradoxes for the theory of items is that paradoxical objects such as the Russell class (i.e. $\{x\colon x \notin x\}$), the liar statement (i.e. "This very statement is false") and the impredicativity property, can be treated as genuine objects, i.e. thesis M1 (stated on p.2) is not violated by such objects.

Paraconsistency likewise can admit radically inconsistent, or contradictory, objects such as these objects for which A and ~A both hold, e.g. $\iota x(xr \,\&\, {\sim}xr)$, to full defensibility. Then $dr \,\&\, {\sim}dr$ where $d \approx \iota x(xr \,\&\, {\sim}xr)$. Moreover this can be done while maintaining, what 2GQ has as a thesis, LNC. It is sometimes thought that paraconsistent logics must reject LNC. This is an error. The argument for excluding LNC from paraconsistent logics turns on accepting what paraconsistent logics have already rejected, namely a consistency assumption. Otherwise the presence of $p_o \,\&\, {\sim}p_o$ in a logic does not force the rejection of $\sim(A \,\&\, {\sim}A)$, but simply induces, what the logic will contain anyway (e.g. through principles such as $p_o \,\&\, {\sim}p_o \rightarrow. (p_o \,\&\, {\sim}p_o) \vee B$) derived inconsistencies.

5. Problems in applying a fully relevant resolution in formalising the theory of items; and quasi-relevantism. In order to construct the theory of items on a relevant logical basis, the logical foundations on which the theory has been built will have to be reworked relevantly. Some of the work has already been indicated in 3, e.g. the theory of internal negation, and the formulation of second-order relevant logics and semantics (with predicate quantifiers understood truth-valuedly); some of the further work is fairly straightforward; but there are several hitches, deserving mention, which in some measure account for the modal approach of preceding sections. The hitches are these:-

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[1] On the other attractions of paraconsistent logics, see Arruda 79 and DLSM.

a. *Identity*. Analogues of the orthodox principles for identity lead to irrelevance (of unacceptable sorts); see UL. An appealing repair in first-order theories involves conjoining certain theorems to the antecedent of =2. For example, the scheme in relevant quantificational logic can take the form:

$$x = y \; \& \; (A(x) \to A(x)) \to . \; A(x) \to A(y),$$

subject to the full proviso, thereby rendering specific the form, $x = y \; \& \; \underset{\sim}{t} \to . \; A(x) \to A(y)$, with the same proviso. Here $\underset{\sim}{t}$ is a sentential constant governed by the two-way rule, $A \leftrightarrow \underset{\sim}{t} \to A$, which serves to represent the conjunction of all theorems. But even though such theories can be made to work they only complicate the issue of how to handle identity in second order theory. There are at least two problems: firstly, whether the first-order forms can be converted to definitional form, and secondly, whether orthodox second-order definitions can be avoided (they can: see below).

b. *Restricted variables*. The classical logical theory, itself hardly free of difficulties, cannot be taken over, because of the heavy and essential reliance on defective principles such as Disjunctive Syllogism. A different theory will have to be devised. It *looks* as if such can be obtained through an intensional functor *such that*. But the adequacy of such a theory has yet to be established.

c. *Choice operators and ξ-terms*. The choice principle, reformulated for relevant implication as

$$A\xi. \quad A(t1x) \to A(\xi xA),$$

leads to irrelevance of a sort, e.g. to such results as $tf \; \& \; {\sim}tf \to . \; uf \vee {\sim}uf$ where u and t are arbitrary terms that may have nothing to do with one another (see PLO, p.223). Worse, if a second-order form of Aξ is adopted, for sentential parameters, outright irrelevance (of an RMingle type) results, such as $p \; \& \; {\sim}p \to . \; q \vee {\sim}q$. The problem is to devise a satisfactory replacement for Aξ. Affected thereby also is the question of the shape of theories of definite and indefinite descriptions in relevant logic. As with hitch (i), a suitable relevant-inducing repair takes the form: $A(t) \; \& \; \underset{\sim}{t} \to A(\xi xA)$, so at least it was suggested in PLO, p.225; and perhaps that form can be replaced by the more specific form: $A(t) \; \& \; (A(t) \to A(t)) \to . \; A(\xi xA)$. But the actual route to irrelevance from Aξ makes use of wff which are not self-consistent, i.e. which imply their own negations (and so merges directly with the problem of choices where the antecedent of Aξ is not satisfiable). Accordingly alternative modifications well worth investigating are those that add to Aξ, in one way or another, the proviso: where A is self-consistent.[1] Such modifications have their costs: the neat elimination of quantifiers (in LR model logics with ξ) appears to be frustrated by all the modifications considered. These hitches underlie others, e.g. identity, the theory of functions; restricted variables, the theory of syllogistic inference and implication; choice, the theory of descriptions.

Note well that hitches (a) and (c) concern relevance of a sort that certainly seems unimportant for paraconsistent purposes. For the types of irrelevance that emerge from these theories are of very limited sorts (typically involving necessary consequents) which do not spread (solid evidence for this in certain cases comes from nontriviality proofs). This is the genesis of quasi-relevantism, a go-for-broke expedient which simply takes over (with due relevant transcription) the identity theory and choice and description theory already elaborated and which tries to get by, in one way or another (extra postulates at worst), with relevantly restricted variables.

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[1] It is an unexpected bonus for connexive logics, where all wff are self-consistent, that an unqualified ξ-scheme can apparently be added without inducing irrelevance.

Even if the hitches are resolved, as one can be moderately confident they will be, or bypassed, as irrelevant for paraconsistency, much work will remain to be done. Since relevant logics or quasi-relevant logics that can be paraconsistently applied do not include all classical logic principles,[1] many classical arguments will have to be recast: the adequacy of classical arguments can seldom be reliably assumed.

6. On limits to postulation and its equivalents, e.g. definitional introduction. An important issue which arises from the postulational method, and from the use of Characterisation Postulates in particular is, what can one assume? And what does postulation or supposition do?

First of all, postulation is much more extensive than is commonly supposed: it affects conventions in the shape, for instance, of semantic or other rules; it includes definitions, whose normal operations, e.g. through identity and replacement, yields definite assumptions. In each of these cases postulation has to be controlled. Because some notions are determined (by other postulates, by how things are, etc.), one is not free to postulate anything one likes, to adopt any conventions or definitions one likes, and expect correctness. To do so would be a bit like expecting to be able to write in an unqualified CP without trouble.

To return to the initial questions. There is no limit to what one can consider or introduce or assume, but the objects introduced may not have the properties they present themselves as having and they may impose logical constraints they are not seen as introducing. Postulation in any of its forms may severely restrict the field of investigation, the class of cases being investigated. A striking and important example is the introduction of a classical-style negation to the semantics for relevant logics. Suppose one introduces a negation $\neg$ subject to the "convention", or semantical rule:

$I(\overline{A}, a) = 1$ iff $I(A, a) \neq 1$,

assuming that it holds for all (normal) situations a of the semantics. Then this is a postulate, and one with damaging effects for relevance. For in virtue of the semantical rules for other connectives, such paradoxes as $A \mathbin{\&} \overline{A} \rightarrow B$ and $B \rightarrow . A \vee \overline{A}$ are rendered valid. In fact the postulated condition narrows the class of situations that can be considered and from this point of view is highly undesirable. It rules out situations where $A \mathbin{\&} \overline{A}$ may hold but B does not, for example. It rules out, in short, situations that are inconsistent or incomplete with respect to $\neg$ negations. Thus one is not free to introduce $\neg$ negation if one likes, given such important objectives as those of ensuring that for every wff there is some situation where it holds and some where it fails.

This sort of phenomenon becomes especially important where the additions would instate or reinstate paradox or unwanted inconsistency, where (unlike $\neg$ in sentential contexts) the extensions are not conservative. The addition of what often seem innocuous definitions may do just such damaging things. A simple example (due to Dunn and discussed in RLR, chapter 4) is the trivialising effect of the connective fusion when added, subject to its basic rules, to dialectical set theory. That is, paraconsistency may be destroyed by what can look (at first) like little more than definitional introduction. Another example (to be considered in chapter 4) is Tooley's addition of a prime disjunction to a Parsons'-style theory of Meinongian objects, the addition rendering the theory inconsistent, and indeed trivial.

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[1] GQ includes all theorems of Q; but λ is only an admissible derived rule of GQ, and does not hold for dialectical extensions of GQ.

7. Living with inconsistency. A common objection, even fear, is that paraconsistent positions (such as that sketched) remove our main, and most important, argumentative weapon, namely the conclusive damage done to a position by having shown it inconsistent. 'Whereas formerly, inconsistency in a position was a fatal criticism of it, now an opponent whose position has been proved inconsistent can cheerfully say: So what!' It is certainly true that the inconsistency charge has been - and, subject to some qualification remains, as will be argued - an important argumentative weapon: it has been fundamental in coherence theories of truth, central in formalist philosophies of mathematics, and basic in pragmatism, where inconsistency in a theory is assumed to force revision always.[1]

But why has consistency been taken to be so fundamental? Because it has been regarded as a guide to truth; sometimes even, mistakenly, in formalist philosophies, as the determinant of truth. An inconsistent theory cannot be true, that is the classical assumption, which paraconsistent positions reject. But inconsistency never was quite as conclusive a criticism as the objection suggests: it was no doubt conclusive in certain circles, e.g. those of empiricism, and pragmatism, but those who think it generally conclusive have lived sheltered lives. Consider a dialectician such as Proudhon, who was not in the least deterred by encountering a contradiction in his theory. Proudhon could still be argued with and persuaded; and he was not committed to everything or beyond the scope of ratiocinative or logical methods.

A more comprehensive account is needed, then, which does not leave consistency as an ultimate test, but which explains its point, e.g. when it is a good criticism, and accounts for its limitations, e.g. in the region of logical paradox. A useful beginning can be made on this question by bringing it down to a practical level: it is worth asking how we, and how paraconsistent people, do argue, what use they make of consistency, and how they proceed in its absence.[2] The answers will help show that and how it is possible to live with isolated inconsistency. Some of the arguments of this book (and of UL especially) try to show why it is rational to do so.

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[1] Thus Haack 74, p.36: 'It is true that, unless it is assumed that a contradiction cannot be true, the concept of recalistrance cannot play its crucial role in the pragmatist picture'. Haack's subsequent argument against a paraconsistent undermining of pragmatism is entirely fallacious; for it imports from nowhere the further assumption that from a contradiction anything can be derived.

[2] The topic breached is a large one: it will have to be taken up again elsewhere, in combination with the preliminary theory of DSLM of types of inconsistency (e.g. unacceptable and acceptable).

§24. *Beyond quantified intensional logics: neutral structure theory, free λ-categorical languages and logics, and universal semantics.* The logical theory thus far elaborated is already substantially richer, especially in - what matters philosophically - intensional idioms, than usual logics. Furthermore it meets conditions of adequacy earlier specified (mainly towards the end of section III); by contrast orthodox logics do not. In particular, the logic is ontologically neutral, not presupposing existential claims; definite and indefinite descriptions appear in it as values of variables; the basic quantifiers are nonontological; the ontic predicates 'E' and '$\Diamond$' are included in the theory and satisfy weak requirements of adequacy; the working implication and entailment relations (of the projected theory) are relatively paradox-free; and finally the logic permits the symbolisation and assessment of a great many arguments that cannot be satisfactorily handled in classical logic. For example, the logic, when applied, facilitates the symbolisation of sentences like those cited early in section I(on p.9).[1] It also enables the assessment of many arguments that have been (mistakenly) considered to be beyond formal reach or to present severe problems for any logic.

Even so the logical theory outlined is no panacea: there is still much it cannot accomplish and much it cannot account for satisfactorily or at all. It is true that many of the known short-comings can be remedied by piecemeal additions to the logical theory, e.g. predicate and other modifiers can be added to quantified intensional logics, so can common nouns, so can further descriptions and quantifiers, the semantical theory can be enriched to allow for contextual variation, and so forth. Nonetheless there are great advantages in having from the outset a more comprehensive and flexible framework. For even given the augmentations of quantified intensional logic mentioned we should still be far from having logical systems rich enough for the analysis of much of English discourse.

On the so-called syntactical front (which includes however, as well as morphology, the question of postulates, i.e. axiom schemes and inferential rules), there are two main classes of problems in devising logical languages of the order of natural languages, both serious enough; namely, that of determining an adequate morphological structure, and that of working out the associated axiomatic constraints. Ways of rectifying the worst morphological deficiencies of formal languages, as bases for natural languge grammars, have been known since the Thirties, ways that again seem promising now that a transformational component offers hope of smoothing the remainder of the way to natural language grammars; but appropriate axiomatic treatment of fully intensional notions, as distinct from modal notions, is only in its infancy, and only recently have such important notions as entailment obtained partial formalisations. Even the question of the incorporation of descriptions and extensional identity into quantificational formalisations of these theories leads, as was seen, to a series of so far largely uninvestigated and unresolved issues.

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[1] The labelled sentences are now symbolised in turn, using fairly obvious symbols for predicate constants.

(α) $(Sx)(p^{E}1x \,\&\, (x = \iota zzf))$

(β) $(\iota zzf)\ 1\ (\kappa xxc)$

(γ) $(\exists z)[zp \,\&\, (y)(y{\sim}E \,\&\, ym \supset.\ z{\sim}ByE)]$

(δ) $(\Sigma t)(Pz)[\xi z(zp \,\&\, zE)w\ z(t) \,\&\, z(t)\ {\sim}E]$

(ε) $(Px)[\iota yym\ \ Tx \,\&\, {\sim}xE \,\&.\ x \equiv \xi z(zr \,\&\, zs)]$

(ζ) $jK(Px)x{\sim}E \ \&\ (Px)jK\ x\ {\sim}E$

(η) $(\exists x)[xm \,\&\, xB(y)(y\Diamond \supset yE) \,\&\, {\sim}(y)(y\Diamond \supset yE)$

Naturally some *due* allowance has still to be made because of the comparative paucity of the current notation as compared with the richness and subtlety of English. (Hence too such rough approximations as that for *mistake*.) The unlabelled sentences are also readily symbolised, in a similarly approximate fashion.

There are two common ways of enriching the morphology of formal languages: either by enlarging the formation rules in the style of a phrase structure grammar which adds as required new grammatical categories and corresponding combination rules, or by switching to a functorial (i.e. categorial) grammar, where new grammatical categories and their controlling rules are derived functorially from a finite set of base grammatical classes. The methods can of course be combined, and in any case the second method amounts to but an important special case of the first since functorial grammars can always be reformulated as phrase structure grammars. The functorial method has great appeal to logicians; for it has, as Ajdukiewicz 35 pointed out, considerable power combined with simplicity, only one or two rules being required to generate a wealth of forms, many of which require separate phrase structure rules; and it has the important merit of running in tandem with functorial semantical methods.

The fact, which has only recently come to be appreciated, is that there is a ready-made formal and semantical theory which leads itself admirably to reinterpretation as a theory with a functorial grammar, which so reinterpreted takes up all that Ajdukiewicz was striving for with his full theory of syntactic connexion and which is ripe for intensional and also significance enlargements. The theory is the simple theory of types, as formulated by Church 40 (in the form which excludes arithmetic) and furnished with a semantics by Henkin 50. Let there be no mistake about what is claimed and what is not: simple type theory is inadequate as a theory of significance (which is what Russell thought type theory was), thoroughly unsatisfactory as a set theory and as a way of resolving the logical paradoxes (which is how the theory is usually regarded nowadays), but extremely promising when reequipped as a basic logic for discourse. When the simple theory of types is so revamped linguistically, it provides a ready-made base for improvements much superior to quantification theory, which it of course includes. Nor is there anything particularly new about construing type theory as a logical theory built on a functorial grammar. Russell himself, after early vacillation, came down, in order to meet Black's objection to the theory, in favour of interpreting types syntactically (see 46, pp.691-2), and the Hilbert school re-expressed the linguistic type rules as formation rules, thereby establishing the modern practice of treating type theory as providing a grammar. Unfortunately however currently prevailing practice has also tended to recast type theory as a set theory and to interpret types ontologically rather than linguistically, thereby throwing away all the advantages and most of the initial plausibility of simple type theory. To avoid confusion of the syntactic construal of the theory with the prevailing one, the theory will be called structure theory, and the labels not type symbols but structure labels of grammatical category symbols. As formulated by Church the theory has in effect only two basic grammatical categories, declarative sentences with structure label ο, or 0, and subjects (proper names on a narrower - too narrow - construal) with structure label ι, or 1.

There are however good reasons for not stopping at two, for including as basic categories at least general terms (including common nouns),[1] with structure label 2 say, and perhaps also imperatival sentences and question sentences. Assume then that there are finitely many basic categories including at least those labelled by 0, 1 and 2. There is just one rule for generating derived grammatical categories, reflected in the following formation rule:

If α and β are structure labels so is $(\alpha\beta)$, or in Ajdukiewicz's notion $\alpha|\beta$.

The derived category with label $(\alpha\beta)$ consists of parts of speech which take an expression with label β and yield one with label α; for example one-place predicates have label (01) since such predicates take a subject and deliver a sentence, and similarly two-place predicates have label ((01)1). This functional mode of category deriviation is an outcome of the following recursive formation rule (which is but Ajdukiewicz' central rule):

2. If E and F are wfps (well-formed phrases) with structure labels $(\alpha\beta)$ and β respectively then (EF) is a wfp with structure label α.

This rule is of course underpinned by a base rule

1. A variable or constant alone is a wfp with structure label as specified:

and this rule is in turn underpinned by a listing of primitive symbols and their respective structure labels. The primitive symbols consist of a (denumerable) set of variables or parameters for each structure label, parentheses, and a set of constants, which include in the extensional-two-valued case the constants N (for negation) with label (oo), K(conjunction) with label ((oo)o), π (universalization, read 'everything') with label $(o(o\alpha))$ and ϵ (arbitrary selection)[2] with label $(\alpha(o\alpha))$, where for an expanded quantification theory α is ι (and where, for a more general theory, which however introduces expressions whose grammatical well-formation is decidedly questionable, α is any structure label). In Church's formulation the functional abstraction symbol λ is classified, along with parentheses, as an improper symbol, and the following formation rule is added for λ-expressions:

3. If E is a wfp with structure label α and w is a variable with label β then (λwE) is a wfp with label $(\alpha\beta)$.

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[1] Lewis 70 does include these as a basic grammatical category and Ajdukiewicz 35 was tempted to do so. As a penalty for not succumbing the Ajdukiewicz theory will generate - when applied to English, not Polish - a stack of ungrammatical sentences, e.g. 'The man hit man', 'A rose hit man and rose smells'. What is worse, though it is not a punishment for succumbing, the Lewis theory fails to generate such sentences as 'Porky is yellow', 'Porky is a pig' (as distinct from 'A pig is Porky') and 'Porky is something' from the lexicon specified (on p.172). But Lewis would no doubt try to argue that such sentences can be recovered transformationally.

[2] Church uses ι instead of ϵ, but here 1 is reserved for definite descriptions. However Church's ι, as it appears in Henkin's formulation, is not a definite description operator but none other than Hilbert's ϵ-operator, as Henkin's semantics at once reveals (cf. §22).

However this rule can be reduced, at the cost of enlarging the syntax marginally, to a case of rule 3 by reclassifying λ as a constant with label $(((\alpha\beta)\alpha)\beta)$ which always applies to a variable.[1] Then, under the reduction, an occurrence of a variable w is bound if it is in a wfp of the form λw (the form of the pure bound variable); otherwise it is free. A wff (well-formed formula) is a wfp whose label is o, i.e. it is a, perhaps open, sentence.

Unlike Church but like Russell, and written English, we generally refrain from writing structural labels on wff (although it is sometimes handy to so index variables). Whenever required a labelled wfp can (like a phrase marker) be derived by adding labels, as determined recursively by the formation rules, to the components, e.g. as subscripts.

It is now easy to explain how it is that structure theory encapsulates Ajdukiewicz's theory so neatly. Ajdukiewicz's theory of syntactic connexion can be seen as consisting of two parts, a theory of concatenation of structure labelled expressions which is mirrored faithfully in structure theory[2] because of rule 2, and a further tentative theory - designed to cope with expressions containing operators - of circumflex operators and constants such as π (with index $s/(s/n)$).[3] But the theory of circumflex functions sketched (which is based on Russell's use of the circumflex symbol in distinguishing functions from function values notationally) is none other than Church's theory of λ-conversion, with the rules of conversion clearly formulated (for the extensional case: 67, p.229): and the further method of reducing quantifiers as operators to constants applied to circumflex expressions is exactly that Church adopts (in 40). Though structure theory captures Ajdukiewicz's theory it in fact goes much further, in as much as it is already fully axiomatised in the two-valued extensional case by Church's theory.[4] The salient point however is that the morphology of structure theory or, what almost comes to the same, the grammar of Ajdukiewicz's full theory, provides a very general framework for logico-grammatical investigations to which a range of axiomatic and semantic systems can be geared.

It is worth exhibiting a little of the power of structure theory for the formalisation of discourse, before turning to its weaknesses and to its axiomatic enrichment. The theory provides a functorial grammar adequate as a base for the formalisation of substantial fragments of English discourse (as the work of Montague 70, Lewis 70 and others indicates). For it not only includes quantifiers and descriptors; by providing a general theory of syntactic connexion it includes a ready-made theory of modifiers, of adverbs and attributive adjectives, in all their iterations and profusion; and Henkin's work once again furnishes a semantics in the easy two-valued extensional case.[1] Enlarged by constants to reflect operators and connectives of English, the applied theory constitutes a theory (of varying adequacy) of all parts of speech.[2] For example tenses can be included as verb modifiers, conjoined and disjoined subjects and predicates can be included simply by letting constants K and A, of conjunction and alternation, have, as well as structure labels ((oo)o), labels ((ιι)ι) for subject concatenation and (((oι)(oι))(oι)) for predicates, and so on. Of course to obtain an axiomatic theory, postulates governing the connectives have also to be added, e.g. a lattice structure would be imposed in the case of compound subjects.

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[1] This observation is due to S. Read. However the reduction while simplifying the syntax adds bound variable wfps of the form λw, for w with label α, and complicates the semantics.

[2] Though the concatenation of structure theory is different because of the way n-place functors are represented.

[3] This theory is not the only one Ajdukiewicz considers in order to deal with operator expressions, but his alternative is unsatisfactory. Furthermore he misses in his general argument on pp.221-2 (which is accordingly flawed) an alternative to λ-theory which is now taken seriously, that of treating quantified phrases as general verbs.

[4] It goes further in other respects as well, e.g. it includes under the Church formulation quantification for every grammatical category - quantification that can however be satisfactorily interpreted substitutionally or in a truth-valued way in cases other than subject quantification.

A crucial weakness of functorial grammars, from the point of view of natural language analysis, springs from the assignment of a single structure label to each expression. For instance a verb like 'rides' may be treated as mapping a single subject to a sentence (i.e. it will have label (oι)), or it can, in effect, map a pair of subjects to a sentence (i.e. it will have label ((oι)ι)), but it cannot do, what 'rides' does in English, both jobs, which depending on its sentence context. The same goes for adverbs and adjectives, and other derived parts of speech, where one and the same unambiguous English expression may, for example, map one or two or more place verbs onto the same and may also map other adverbs to adverbs and adjectives to adjectives (e.g. quietly, quickly, silently). This fundamental problem[3] can however be avoided (if not resolved) by allowing derived categories - not basic ones or effectiveness could be jeopardised - to have labels which may vary within specified limits. For example a predicate (general verb) can be characterised as an expression with structure label π_k (i.e. (...((oι)ι)...ι) with k occurrences of ι, for some k; and the verb 'rides' would be assigned label π_k with k restricted to 1 or 2. Then in any given occurrence precisely which label 'rides' has will be determined by its frame of occurrence. In short the problem may be circumvented by making the reduction of an English sentence to logical form frame (or context) sensitive. Since the reduction is frame sensitive the language being reduced has really to be assigned at least a frame-sensitive functorial grammar. The structure labels of expressions of derived grammatical categories are determined in a sentence frame by the expressions upon which they operate; for example 'Tom rides Dobbin' is first recast in logical order as '((rides Tom) Dobbin)'; then since the whole is a sentence and 'Tom' and 'Dobbin' each have label ι, π_k is resolved to π_2.[4] The sentence is not ambiguous and unlike ambiguous sentences has only one reduction.

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[1] That Church's type theory provides a ready-made and attractive theory of modifiers was pointed out by M.K. Rennie. He convinced me that there was a worthwhile role for type theory after all (albeit a distinct role from the one he has elaborated in 73). The many virtues of type theory as a theory of modifiers are brought out in his 73. Structure labels such as π_k are taken therefrom.

[2] For should there be any parts of speech that cannot be derived functionally they can as a last resort be treated as further basic categories. This is not to gloss over the very substantial class of unsolved problems where transformations of some effective sort will have to be applied in the reduction to logical form, e.g. a prominent case is that of predicative adjectives following inert verbs such as 'is, 'looks', 'grows', and 'becomes'.

[3],[4]. (Footnotes on next page).

1.24 INTENSIONALISING STRUCTURE THEORY

A serious weakness of structure theory, insofar as it simply reinterprets type theory, is its extensionality. The worst features of Church's theory can be avoided, as is well-known, by simply omitting the axioms of extensionality. Nonetheless it remains essential to intensionalise the resulting structural logic; for although intensional discourse can be formally represented once extensionality axioms are omitted, its main logical and semantical features cannot be revealed, and many logical relations are either destroyed or have to be specially postulated. As R. Ackermann explains (72, pp.16-18), without intensionalisation even simple entailments such as that John believes that Tom is tall and Tom is thin entails that John believes that Tom is thin, and simple reference statements such as that John's beliefs are about the same person, cannot be accommodated. A crucial corresponding semantical reason for intensionalisation is that otherwise the semantic evaluation of compound expressions cannot be obtained from the evaluation of their components. A merely extensional logic with an extensional semantics is inadequate to deal with the effect of connectives and modifiers in expressions such as 'necessarily 2 + 2 = 4', 'walks rapidly', and 'possible president'. For example in the case of 'possible'

> one can find two common nouns ζ and η corresponding to the same set of individuals - or having as we should ordinarily say, the same extension (with respect to the actual world and the standard model) - but such that 'possible ζ' and 'possible η' have different extensions. (Montague 70, p.220).

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[3] (Footnotes continued from previous page).

This is Rennie's description of the problem (in 73). As he points out the problem appears to affect not only type theories but any theory, such as his theory of predicate modifiers based on quantification logic, which employs a set-theoretical semantics. The problem for quantification logic can however be escaped in semantic theories which are not set-theoretic; e.g. by building on a semantics like that of §§15-16 or that of Church 56 for quantificational logic where predicates are simply assigned relations (not sets of ordered elements) which can reflect the varying adicity of the predicates they model.

[4] There will be corresponding semantic ado about obtaining the correct relations between 'rides' with label π_1 and 'rides' with label π_2. Moreover the method opens the way to other problems. Thus if 'rides' is the same in such sentences as 'Tom rides', 'Tom rides every day', 'Tom rides Dobbin' and 'Tom rides Dobbin every day', then such sentences as

Tom rides and in fact Tom always rides Dobbin

should be open to quantification to yield

For some f, Tom f and in fact Tom always f Dobbin,

something that type theory proper certainly excludes. But there is no reason why quotational (generalised substitutional) quantification, in this case for predicates of variable adicity and read 'for some predicate qu(f)', should not be invoked. Whether the type-theoretic restriction is mandatory or not depends on how the logical paradoxes are to be formally averted, and this depends on features of the axiomatisation, in particular on substitution principles. In contrast the set-theoretic paradoxes need cause little concern; for set theory can be axiomatised using the constant $\in$ with label $((o\iota)\iota)$ along standard lines.

An immediate outcome of the compounding requirement is that modalisation alone is inadequate. For there are many connectives and modifiers, e.g. 'Tom believes (that)', 'it is interesting (that)', 'allegedly' for which substitution or interchange conditions are stronger than modal, i.e. than intersubstitutivity of strict equivalence of some brand - with the result that functionality once again breaks down if only intensionality of modal strength is required. By basing the theory not on a modal logic but on a relevant logic, this problem can be substantially reduced.[1]

The business of intensionalising structure theory is unproblematic, at least as far as the logical syntax is concerned. We add an implication F with structure label ((oo)o) and define $(A \to B)$ as $((FA)B)$ where A and B are wff; thus $(A \to B)$ is a wff. Replace the axioms, 1-4 of Henkin 50, for classical two-valued logic, by a set of axioms (without structure labels attached) for entailment (e.g. any set from RLR), the quantificational axioms, 5^{α}-6^{α}, by a set of axioms for quantification with entailment (as set out in §23). Abandon, most certainly axioms 10, of extensionality. Replace '$\supset$' in the ϵ-axiom, 11, and the rule of detachment, V, by '$\to$'. Otherwise the revamped Church system is kept; e.g. the rules for substitution and λ-conversion remain as formulated in 50, though it now follows of course that $(\lambda x A(x))(y) \leftrightarrow A(y)$, and weaker equivalences no longer guarantee their intersubstitutivity. In fact however, the postulates can be drastically chopped, since the whole quantificational structure and rule VI may be derived using the ϵ-axiom

11. $A(x) \to A(\epsilon A)$, where A has label $(o\alpha)$ and x label α, for any α.

But designing an adequate semantics for such an intensionalised structure theory is by no means so unproblematic (as already observed in §23).

The intensionalising of structure theory is only the first of a series of desired improvements. The next step of making the theory into a significance theory is easy when the starting theory is extensional structure theory; the axioms (of reinterpreted type theory) are simply replaced by those from systems QS_6 and QSE of Slog, Chapter 7. But the matter of amalgamating significance and intensional enlargements is not so easy and much work remains to be done, as also in the conversion of these logics into context logics (along the lines laid out in Slog, Chapter 2).

As in the syntactical case, so also in the semantical case, though the framework for general semantics has been progressively and strikingly enlarged since the early pioneering days, the main modern framework is still too austerely fashioned, in several important respects which severely limit its adequacy for the analysis of discourse and in providing a background setting for philosophical problems; namely, through

(a) the restriction to possible worlds,

(b) the restriction to possible individuals,

(c) the restriction to an underlying two-valued (and usually first-order) account,

(d) the meagre role, if any, assigned to context.

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[1] See RLR, chapter 7 ff. Problems as to exactly which substitution conditions obtain for ultramodal functors, and how functors of more than entailment strength can be accommodated, are discussed briefly in Slog, 7.2, and further in RLR. The important case of belief is dealt with below (especially in chapter 8).

Each of these restrictions can, as we have began to see, be removed, (a) by the inclusion of impossible and incomplete worlds and theories, (b) by the inclusion of inconsistent, incomplete and indeterminate items, whether individual or not (thus (b) generalises on (a)), (c) by enlarging the number of values, and (d) by using context supplied functions in semantical evaluations. Moreover the admission of more of discourse forces the abandonment of these restrictions, e.g. the admission of belief and entailment functors forces the abandonment of (a), and the general admission of singular descriptions, which has been strenuously advocated, compels the abandonment of (b), since some descriptions are not about possible individuals but are about items which are impossible. Naturally these desirable extensions of the semantical framework bring in their turn many new problems, some of them technical, such as the amalgamation of theories designed to surmount just one of the restrictions, and some of them philosophical.

There are two main and now very familiar reasons why these philosophical problems arise. Firstly, philosophers mistakenly committed to the Ontological Assumption that what they talk about must exist, are reluctant, to say the least, to talk about inconsistent or incomplete items, which of course do not exist; and hence are loath to use the enlarged semantical framework. Philosophy has generally - as part of the prejudice in favour of the actual - been opposed to indefiniteness, to the indeterminacy and ill-roundedness of objects: only inconsistency is considered worse. Secondly, the enlarged semantical framework is not only open to rival (metaphysical) construals, but is rich enough to incorporate views of rival philosophical positions. This emerges especially in that supposed paradigm of philosophical neutrality, the theory of truth. Each formal philosophical theory, each different theory of descriptions for example, will fashion its own theory of truth, and philosophical disputes will be reflected in different truth-values assigned and equivalences admitted, e.g. for sentences containing non-denoting descriptions. (Admittedly many - not those which disagree about what can be true or false, and not all many-valued theories - will lead, for some class of sentences, to versions of Tarski's convention T, but even these theories will disagree about what count as equivalent reformulations of the convention.) There will also be dispute about the formulation of the theory of truth, whether it should be model-theoretic, domainless or merely substitutional, about the relation of the metatheory to the object language, about the point of extensionality and the extent to which it is mandatory, and so forth. In short, the semantics, and the theory of truth it incorporates, cannot hope to be very philosophically neutral, and cannot in general offer any resolution of philosophical issues but only, what is nonetheless very important, a sharpening and reformulation of them. One reason for interest in the wider semantical framework, connected naturally enough with its importance in supplying a semantics for much more of discourse, is that it promises to supply a unified semantics for, and a generalised framework for, the theory of objects.

To develop the very general semantical theory sought, one important and difficult preliminary problem consists in characterising (natural and suitably recursive) languages with sufficient generality, and ideally in a way linkable with complete generality if a truly universal semantics is to be attained. The preliminary task is first addressed.

Hitherto the approach has been rather piecemeal and partist, the aim being to approximate the full theory sought (which includes that of objects) from below by incremental steps. Now the approach is very general and more holistic although remaining analytic, and the aim is to approximate the full theory from above, by specialisation and the addition of detail to the general theory. The results of approximation from above and below can, with suitable adjustment, be valuably combined, and in this way the theory better defined.

1. A canonical form for natural languages such as English is provided by λ-categorial languages? Problems and some initial solutions. There are several conditions which the canonical language should meet:

(i) It should contain declarative sentences and a full range of intensional connectives. Though it is taken as a defining feature of languages that they consist of sentences, for such purposes as context assessment one may need to consider larger units of discourse such as paragraphs.

(ii) It should contain variables and variable binding devices and permit the characterisation of quantifiers, descriptors and analogous devices. It is for this reason that pure categorial languages, which lack these variable binding devices, are inadequate.

It can be correctly assumed, however, that every variable binding operation, such as those of quantification, can be separated upon analysis into two components: namely firstly a variable binding component which can be represented by something like Church's lambda abstraction, and secondly a constant operation (like a sentential function) on the resulting bound expression; e.g. $(x)A$ is represented by $\Pi(\lambda xA)$ where Π is a constant. In short, every variable binding operation such as quantification and description can be represented in the style of Church's type-theory of 40.

A predicate system, or even a standard type system, enriched by arbitrarily many connectives, descriptions and quantifiers is nonetheless inadequate. The inability of such systems to treat adjectives and adverbs adequately is their first conspicuous inadequacy (see e.g. Rennie 73). The problem can be largely resolved, as just explained, by adopting a structural language with a functional or categorial logic, thus enabling a third condition of adequacy to be met, namely that

(iii) the language should facilitate the treatment of such parts of speech as adverbs and adjectives, and indeed should enable all traditional parts of speech to be encompassed.

Given that

(iv) the canonical language should be exact and recursively structured like a logical system,

conditions (i)-(iii) virtually force the adoption of something at least as powerful as a λ-categorial or Church type-theoretic language. Thus such a language appears to be minimal in meeting canonical language requirements; anything weaker, such as applied quantificational logic, would be inadequate.

At the same time a λ-categorial language meets requirements on a canonical language that have commonly been considered desirable (Cf. Montague 70 and Cresswell 73 both building on arguments of Chomsky):

(v) It should be unambiguous. As a minimum condition no expression should belong to more than one syntactic category (or type). This condition strictly construed, enforces the functional character of a canonical language: otherwise ambiguities could arise in phrase construction (cf. Montague's *disambiguated* languages of 70). For categorial languages, which meet this condition, it is a source both of strength (because of the tectonics: it makes the canonical grammar simple, elegant, flexible, and closely aligned with semantics) and of weakness (because certain constructions appear initially to be excluded).

(vi) It should be grounded, i.e. the grammar should be built up from a set of basic categories which are not further analysed. There are no infinite descending chains or circles in analysis so that somewhere no bottom categories are reached; thus there will be basic syntactic categories.

(vii) It should be appropriately finitary. In particular sentences should be of finite length only, and each basic grammatical category should contain only finitely many constants.

The fact that λ-categorial languages meet conditions (i)-(vii) does not of course show that they are adequate, and it is not obvious that they are adequate. It is evident, however, from much recent work that λ-categorial languages can go a very long way in furnishing a canonical form for English, in encompassing without much further ado virtually the whole range of parts of speech of English, and that there are ways around most so far observed shortcomings of these languages as canonical structures.

Nonetheless λ-categorial languages, though they include most present-day formal systems, are by no means the most general forms of languages; for they exclude phrase structure languages which are context-sensitive, and thereby many languages of linguistic and computational interest, and they exclude concatenation, and thereby Post-style languages built up in a simple way using concatenation. The omission of concatenation itself is easily rectified by adding an improper (untyped) symbol '$\frown$', with a status similar to that of parentheses, and defining *strings* thus: a symbol A alone is a string; and if A and B are strings so is $A^\frown B$. However strings are not *well-formed* phrases (wfp) of a λ-categorial language, but only correspond in certain cases to wfp, and without modification (freeing) of the language the class of well-formed formulae is fixed so as to exclude sets of strings which may be grammatically admissible.

Since λ-categorial languages are far from completely general among formal languages that provide recursive grammars, their adequacy as deep structures for natural languages will have to be defended differently, as being adequate when coupled with transformations (see 6 below), and on somewhat more empirico-pragmatic grounds, crudely that they will do the job. There are two main classes of objections to the hypothesis that λ-categorial languages are adequate, namely:

(i) *Excessive width*: they would admit as well-formed (grammatical) sentences which are not. To meet this criticism Cresswell (73, p.224) appeals to (unspecified) acceptability principles. An alternative, here favoured (for reasons given in Slog, especially chapter 4), is to appeal to a significance filter; that is, the canonical language generates as grammatical both significant and non-significant sentences, and a significance theory then filters out the non-significant sentences. The main result (I) below in no way upsets, but facilitates, this position; for if every logic on a λ-categorial language has a two-valued worlds semantics then ipso facto it has a three-valued (significance) semantics, and the significant sentences, i.e.

the class of sentences A for which GA on an appropriate significance functor 'G', can be isolated (see 6 below).

(ii) Excessive narrowness: they would exclude as ill-formed sentences that are not. A classic example is provided by adjectives (the "problem" of predicative adjectives). Attributive adjectives are readily handled in categorial languages: they map common nouns, with syntactic category label 2 say, to common nouns, and hence they have type label (22). Such adjectives also function however, without ambiguity it would seem, as predicative adjectives. But to combine with the verb 'is' which maps a pair of subjects to sentences and accordingly has type label 0(1,1) an adjective used predicatively would have to have label 1, not label (22), yet the functional character of categorial languages precludes a part of speech from carrying dual type labels. The problem can only be met within λ-categorial languages by transforming predicative occurrences of adjectives so that they do not figure in deep structure, and the obvious strategy is to transform the occurrences into attributive cases. This can be done by generalising one-insertion which operates thus:

> '... is f', where 'f' is an adjective, becomes '... is an f one';
> e.g. 'That flea is large' transforms to 'That flea is a large one'.

A generalised one, which occurs in deep structure only, is needed to cope with subjects like 'the heat' or 'the dust'. Of course 'One what?' has still to be specified in sentences like 'Tom is a big one'; but this specification can be supplied by the context (see Cresswell 73, pp.184-5, and also Slog: the important issue of context will be taken up again in 7).

That there is scope for insertions in the transformations from surface English structure to canonical form (and correspondingly for deletions in the inverse transformation) means that so long as no bounds are imposed on the class of insertions any apparently relational features of surface grammar can be removed in favour of functional features of canonical form by the introduction in the transformation of further appropriate distinguishing factors reducing relations to functions (cf. 6). For this reason too it is difficult to test or falsify the hypothesis that the deep structure of English is λ-categorial.

The same strategy - insertion in transforming to canonical form - may be applied in an attempt to surmount the fundamental problem (already remarked) of using a formal language as canonical language. Rennie provides an excellent account of the fundamental problem of modifier theory - that

> English the same modifier can modify predicates of different adicity and the problem is to find what connections there are between a modifier's operations in different cases (73, p.62);

but the same problem already arises for English predicates, e.g. 'worry' and Montague's 'walks', and arises elsewhere, e.g. strikingly in the case of quotation operations which form subjects from any string. As explained, type labels may be added in the course of transformation to canonical form, or variable labels pinned down, the resulting particular label depending on the sentence context, i.e., the reduction to deep structure is sentence context sensitive. This does not imply that the surface structure need be ambiguous (though the endemic problem of type-theoretical logical bases is that of locating ambiguities where there are none); the specification of variable or open labels need not be counted as a case of ambiguity, in contrast to other notations, e.g. different labels attaching to various occurrences of 'bank', which do reflect ambiguity.

This way of grappling with the fundamental problem is however none too satisfactory. A superior alternative, which gives all the advantages of the variable label method, is to free primitive expressions from their association with a single fixed label, and to allow them to have a multiplicity of structural labels. This relaxation of type-theoretical conditions, which leads to free λ-categorial languages, is investigated shortly.

In conclusion, not only are (free) λ-categorial languages extremely promising (though not unique) candidates as canonical languages for natural language analysis, but it is not going to be a straightforward matter finding decisive counterexamples which bring them down. It is with some confidence then that we can turn to the formal semantics of (free) λ-categorial languages as providing a basis for semantics for English and other natural languages.

2. Description of the λ-categorial language L. As well as the main language L described, which is but a simple extension of Church's simple type theory 40 to include (as in Kemeny 48) several types, a variant though equivalent form L', essentially the language used by Ajdukiewicz 35 and Cresswell 73, is described.

A. Structure Labels, i.e. Syntactic Categories

(1) Each of 0, 1, 2, ..., m for some (natural) number $m \geqslant 0$ is a structural label.

(2) If α and β are structure labels so is $(\alpha\beta)$.

Let $FNat_m = \{0, 1, ..., m\}$. The class Syn of structure labels or syntactic categories is defined, in the usual finite case, as the smallest class satisfying

(1) $FNat_m \subseteq Syn$

(2) If $\alpha, \beta \in Syn$ then $(\alpha\beta) \in Syn$.

In the Ajdukiewicz-Cresswell form (2) is replaced by the more elaborate rule

(2') If $\alpha, \beta_1, ..., \beta_n \in Syn$ then $\alpha(\beta_1, ..., \beta_n) \in Syn$.

In the Church-Henkin form the effect of (2') is got by iteration of (2), i.e. $\alpha(\beta_1, ..., \beta_n)$ is represented by $(...((\alpha\beta_1)\beta_2)...\beta_n)$.

B. Symbols (Primitive Symbols)

(1) Denumerably-many variables or parameters, for each structure label α: x, y, z, f, g, x', y', ...

(2) Finitely-many constants, each with some one structure label α: C, D, Q, a, b, C(1), D(1), ...

(3) Improper symbols: λ, (,).

Thus each proper symbol A has a unique structure label α associated with it. No division of constants into logical and extralogical constants is required. Thereby one of the main sources of criticism of previous semantical theories is avoided.

Alternatively the proper symbols may be specified by functions Con and Var defined on Syn, as in Cresswell, 73. Then Con_α is the finite class of constants with label α, and Var_α is the denumerable class of variables with label α. Con_α is null for all but finitely many α. Parentheses are convenient but not unavoidable. The presence of λ (and variables) is what distinguishes a λ-categorial language from a (pure) categorial language.

C. Well-Formed Phrases (wfp; Expressions)

(1) A variable or constant alone is a wfp with structure label as specified, i.e. where B_α is a variable with label α (written: B_α is a variable for short) it is a wfp with label α, and where A_α is a constant it is a wfp with label α.

(2) If E and F are wfp with structure labels $(\alpha\beta)$ and β respectively then (EF) is a wfp with structure label α.

In the Ajdukiewicz-Cresswell form (2) is replaced by

(2) If $E_1, \ldots, E_n$, F are wfp with respective structure labels $\alpha_1, \ldots, \alpha_n, \beta(\alpha_1, \ldots, \alpha_n)$ then $F(E_1, \ldots, E_n)$ is a wfp with structure label β.

(3) If E is a wfp with structure label α and w is a variable with label β then (λwE) is a wfp with label $(\alpha\beta)$.

(A many variable version (3'), also possible, would chime in better with the Ajdukiewicz-Cresswell form, but has never in fact been used.) Rules (1)-(3) specify the class wfp. Structure labels are simply associated with wfp; but it is convenient in what follows to subscript a wfp by its associated label in the fashion of some type theories. An occurrence of a variable w is bound if it is in a wfp of the form (λwE); otherwise the occurrence is free.

A (declarative) wff is a wfp with label 0. A (declarative) sentence is a closed wff, i.e. one with no free variables. The question as to whether imperative and interrogative sentences have label 0 or even occur can be left open. (In a wider classification one might have: a declarative wff is a wfp with label 0; an imperative wff is a wfp with label 3; an interrogative wff is a wfp with label 4, etc.) In a language with subject-predicate forms a subject is a wfp with label 1. It is not essential however for the present analysis that sentences have subjects. What is essential for a semantical analysis by way of a truth definition is that a class of declarative sentences which are bearers of truth-values be included.

A λ-categorial language is represented then by a structure $<FNat_m, Syn, Var, Con, Wfp, 0, \lambda>$, and a categorial language is represented by a similar structure but without symbol λ. Conversely λ-categorial languages can be embedded in categorial languages with a suitable constant $\lambda_{\alpha\beta\alpha\beta}$.

The finiteness restrictions, to finitely-many syntactic categories and to finitely-many constants, are quite inessential in what follows and can be removed. The same applies to denumerability restrictions. Thus the categorial languages considered include all the disambiguated languages of Montague's universal grammar of 70, and, insofar as Montague's universal grammar is universal, so also will the semantics given be universal.

3. Logics on language L. A language L may have one or more logics associated with it. Whether a language has an intrinsic logic or a unique logic associated with it, e.g. a class of analytic truths, can be left open. But it is evident that languages generally have a multiplicity of associated logics.

One of the theses to be established is that every logic associated with or on L has a two-valued worlds semantics. It will suffice to show that a sufficiently representative arbitrarily selected logic S on L has such a semantics.

It can be supposed, without important loss of generality, that S can be represented by a pair $<\mathcal{H}, \mathcal{R}>$ where $\mathcal{H}$ is a (countable) set of axioms and $\mathcal{R}$ is a (countable) set of derivation rules of the form: where $A_1, \ldots, A_n$ are theorems so is B, i.e. $A_1, \ldots, A_n \rightarrow B$ for short. Proof and theoremhood can be defined in much the usual way.

Providing a Tarski-Montague semantics for a language then becomes a special case of providing a semantics for a logic S on L. It consists of that special case where the truths expressible in the language are taken as axioms and the rules (if any) do not enlarge on the class, e.g. if some rule is required it can be just repetition: $A \rightarrow A$, or say the rules of variable change and λ-conversion. Call such a logic the truth-logic. Then the (basic) semantics of a language is the truth-logic on L.

It is assumed that λ-categorial logics, i.e. logics on λ-categorial languages, bring out the basic logical features of λ-conversion. To achieve this objective it is advantageous to have as well as 'λ' some further logical constant; the cheapest solution appears to be that adopted, of taking a structural identity connection, ≡, as fundamental. A similar solution is adopted in Cresswell (73, p.88 ff.), where a relation 'conv' of conversion, tantamount to '≡', is introduced. The constant ≡, which satisfies Leibnitz identity conditions, behaves very like a synonymy link. The connection is essential in representing logically transformations and derivations in deep structure which exhibit sameness of deep structure (it is for this reason that ≡ is dubbed 'structural identity').

Where the logic of λ-conversion is not however required both the logic of λ and the associated logic of ≡ can be dropped, as will emerge. That is, categorial languages need not meet any common logical constraints.

A. The Basic λ-Categorial Logic B

Logic B contains the specific constant Q with label $(O\alpha)\alpha$ (for any structure label α). A structural identity connective ≡ is then defined:

$$(A_\alpha \equiv B_\alpha) =_{Df} (((Q_{(o\alpha)\alpha})A_\alpha)B_\alpha)$$

B has as postulates just the principles of Leibnitz identity and λ-conversion. (The postulates generalise those of Routley-Meyer 76 for austere equivalence.)

B. Axiom Schemes

A1. $A_\alpha \equiv A_\alpha$

A2. $((\lambda x_\gamma A_\beta)B_\gamma) \equiv S^{x_\gamma}_{B_\gamma}(A_\beta)|$

i.e. $\equiv A_\beta[B_\gamma/x_\gamma]$,

i.e. the wfp which results from A_β by substituting B_γ for x_γ throughout A_β, provided that the bound variables of A_β are distinct both from x_γ and the free variables of B_γ. (λ-conversion)

Alternatively A2 may be replaced by rules of λ-conversion, that is, rules (II) and (III) of Henkin 50 (i.e. rule RC of 6).

C. Rules

R1. Where A_o and $A_o \equiv B_o$ are theorems, so is B_o; i.e. $A_o, A_o \equiv B_o \rightarrow B_o$. (Structure detachment).

R2. Where D_β results from C_β by substitution of B_γ for A_γ in one occurrence (derivatively, zero or more occurrences) in C , and $x^{(1)}_{\alpha_1}, \ldots, x^{(n)}_{\alpha_n}$ include all the free variables of A_γ and B_γ which also occur as bound variables of C_β, then if $A_\gamma \equiv B_\gamma$ is a theorem for every $x^{(n)}_{\alpha_1}, \ldots, x^{(n)}_{\alpha_n}$, so is $C_\beta \equiv D_\beta$.
(Substitutivity of equivalents).

R3. Where x_γ is a variable which is not free in C_β, y_γ is a variable which does not occur in C_β, and B_o results from A_o by substituting $S^{x_\gamma}_{y_\gamma}C_\beta|$ for a particular occurrence of C_β in A_o, then, if A_o is a theorem, so is B_o.
(Bound variable change).

The logics S considered are, to begin with, all extensions of B obtained by adding axioms or rules; but subsequently it will be shown how the restriction to extensions of B can be appropriately qualified and indeed removed entirely in the case of categorial languages. Among the logics considered are the λ-closed sets of sentences of Cresswell 73.

The metalogic MS of logic S on L will be that discussed in Rennie 73, pp.75-6 (or Tichý 71, pp.283-5) - save that the set {0, 1, ..., m} replaces {o, ι} and the class of formulae is correspondingly enlarged and that the neutral quantificational notation is adopted - together with a fragment of English. The semantics for S will however be entirely representable in the type enlargement MS of Rennie's logic without English. Specifically, the formalism of MS differs from the type theory of Henkin 50, apart from purely notational changes, only in replacing Henkin's rule I for type symbols by the rule:

0, 1, ..., m, κ are type symbols.

κ is the world label of Rennie, and D_κ the set of worlds. Rennie's argument, effectively that MS is an extensional logic, can be filled out formally by appeal to Carnap's characterisations of extensional languages and systems (as given, e.g. in MN). The extensionality of MS may then be proved using the results of Henkin 50, p.56. The importance of the extensionality of MS will emerge when Carnap's thesis of extensionality is proved for all languages and systems expressible in L.

4. The semantical framework for a logic S on L. A basic S-model is a structure $M = \langle T, K, D, \nabla, v\rangle$, where K is a set (of worlds); T (the base world) is an element of K; D and ∇ are functions from structure labels, i.e. defined on Syn, whose values are non-null sets, and v is a valuation function which assigns values to each variable and each constant of L. D, ∇ and v are specified in more detail as follows:

$\mathrm{D}_o = 2 = \{1, 0\}$; for $1 \leqslant j \leqslant m$, D_j is an arbitrary set (e.g. on standard accounts D_1 is the set of rigid subjects or pure individuals); then $\mathrm{D}_{\alpha\beta}$ is defined as the class of functions from D_β into D_α.[1]

For $0 \leqslant j \leqslant m$, $D_j = \mathrm{D}_j^K$; otherwise $D_{\alpha\beta}$ is the class of functions from D_β into D_α. The members of D_o, maps from K to $\{1, 0\}$, are assertions; they correspond 1-1 to LA-propositions or ranges, classes of elements of K.

Function v assigns thus:

v1. to each initial variable A with label α an element ($\rho_{\alpha\kappa}$ say) of D_α, i.e. $v(A_\alpha) \in D_\alpha$.

v2. to each initial constant A with label α a relation $\mathcal{R}^A_{\kappa[\alpha]}$, i.e. $v(A_\alpha) = \mathcal{R}^A_{\kappa[\alpha]}$. For a genuine constant the relation will be subject to constraints.

The κ-transform $\kappa[\alpha]$ of label α is defined inductively as follows:

(1) If $\alpha = j$ for $0 \leqslant j \leqslant m$ then $\kappa[\alpha] = (j\kappa)$; and

(2) if α is of the form $(\beta\gamma)$, $\kappa[\beta] = (\kappa[\beta]\ \kappa[\gamma])$.

In short, the κ-transform results by replacing each basic category label j by $(j\kappa)$ throughout α. A similar transform is used by Bressan (72, p.12).

∇ satisfies the following conditions:

∇i. $v(A_j) \in \nabla_j \subseteq D_j$, for every wfp A_j, $0 \leqslant j \leqslant m$.

∇ii. $\nabla_{\alpha\beta} \subseteq \nabla_\alpha^{\nabla\beta}$

∇iii. $v(A_\alpha) \in \nabla_\alpha$, for each initial variable or constant A_α of L.

Lemma 1. $\nabla_B \subseteq D_\beta$, for each β. (Proof is by induction on D_β.)

In case $Q_{(o\alpha)\alpha}$ satisfies the postulates of logic B, there remains one condition on $T = v(Q_{(o\alpha)\alpha})$ where T has label $((O\kappa)(\alpha\kappa))(\alpha\kappa)$, namely

T1. $T\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$ iff $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$.

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[1] Since a rigid semantics will work, ipso facto a semantics which allows for world by world variation of subject signification will work. Rigidity involves no loss of generality.

An interpretation I, of S, associated with valuation v is a function defined on wfp satisfying, quite generally, the following conditions:

Ii. $I(A_\alpha) = v(A_\alpha)$, for each initial variable A_α;

Iii. $I(A_\delta) = \mathcal{R}^{A}_{\kappa[\delta]}$, for each initial constant A_δ of L.

More explicitly, where $\delta = (\ldots((\beta_1\alpha_1)\alpha)\ldots\alpha_n)$ with β_1 a basic component in the constant A_δ (i.e. β_1 is not analysed in the logic of A_δ) and where $\rho_i \in \nabla_{\alpha_i}$ for $1 \leqslant i \leqslant n$,

$$I(A_\delta) = \lambda\rho_1 \ldots \lambda\rho_n\, \lambda\alpha_\kappa \mathcal{R}^{A}_{\kappa[\delta]}\, \rho_1 \cdots\ \rho_n \alpha_\kappa$$

Iiii. Where A_δ has the form $B_{\alpha\beta}C_\beta$, i.e. $A_\delta = A_\alpha$,

$$I(A_\delta) = I(B_{\alpha\beta}C_\beta) = I(B_{\alpha\beta})(I(C_\beta)),$$

i.e. $I(B_{\alpha\beta}C_\beta)$ is the value of the function $I(B_{\alpha\beta})$ for the argument $I(C_\beta)$.

Iiv. Where A_δ has the form $(\lambda w_\beta B_\gamma)$, $I(\lambda w_\beta B_\gamma)$ is that function whose value for the argument ρ of $\nabla\beta$ is $I'(B_\gamma)$, where I' is that w_β-variant of I for which $I'(w_\beta) = \rho$, i.e. I' agrees with I on all initial assignments except at w_β where $I'(w_\beta) = v'(w_\beta) = \rho$.

It is evident that the function D can be eliminated from basic S-models, i.e. basic S-models can be represented adequately, as far as the semantics goes, by structures $<T, K, \nabla, v>$.

Lemma 2. $I(A_\alpha) \in \nabla_\alpha$, for each wfp A_α of L.

Proof is by induction on the construction of A_α. The basis for wfp $I(A_j)$ is immediate from ∇i. For the induction it is assumed that the hypothesis has been established to a given stage in wfp construction both for I and for its variants. Then Iiii and Iiv follow using ∇ii, and Iii using ∇iii.

For each postulate of logic S a corresponding semantical condition is imposed on the modellings of S. A translation sp is defined translating syntactical schemes into semantical schemes. The postulates added in the case of the theory of items will naturally be those introduced in previous sections.

A translation sp(A) of wfp A with respect to model M is an interpretation sp on M. The function sp is defined recursively, from a given initial clause, for every wfp in a way paralleling the definition of interpretation on I in M; thus:

$sp(A_\alpha) = \rho$ with $\rho \in D_\alpha$, for each initial variable A_α;

$sp(A_\delta) = \mathcal{R}^{A}_{\kappa[\delta]}$, for each initial constant A_δ;

$sp(B_{\alpha\beta}C_\beta) = sp(B_{\alpha\beta})\ sp(C_\beta)$;

$sp(\lambda w_\beta B_\gamma) = \lambda\rho sp'(B_\gamma)$, where sp' differs from sp on initial assignments only at w_β and $sp'(w_\beta) = \rho \in \nabla_\beta$.

It will simplify work to take the translation sp(A) of wfp A with respect to M to be simply its interpretation with respect to M, i.e. $sp(A_\alpha) = I(A_\alpha)$ for every (initial) wfp A_α.

Where A is an axiom of S and $\alpha = sp(A)$, the semantical postulate for (corresponding to) axiom A is $\alpha(T) = 1$. Similarly where $\alpha_1 = sp(A_1), \ldots, a_n = sp(A_n)$, $\beta = sp(B)$, the semantical postulate for the rule: $A_1, \ldots, A_n \rightarrow B$ is:

if $\alpha_1(T) = 1$ and ... and $a_n(T) = 1$ then $\beta(T) = 1$.

The provisos on rules and axiom schemes translate into provisos on corresponding semantical postulates. The adequacy of the method of representing rules, which is not obvious but will be established, turns on the fact that world T just is the set of theorems of S. That the method works helps account for the twisted character of the general semantics given.

The semantics given is basically (an elaboration of) that version of the "neighbourhood" semantics called by Hansson and Gärdenfors 73 'the "f" version'. It is isomorphic to the neighbourhood semantics used in Routley-Meyer 76, differing only in the placement of label κ. For example, whereas the neighbourhood semantics assigns to a one-place connective $\Box_{(oo)}$ a relation $\mathcal{R}_{o(o\kappa)\kappa}$, the 'f'-version assigns relation $\mathcal{R}_{(o\kappa)(o\kappa)}$ (cf. Rennie 73, p.81); and they assign respectively to n-place connectives $C_{((oo)\ldots o)}$ relations $\mathcal{R}_{\vdots(o(o\kappa))\ldots(o\kappa)\kappa}$ and $\mathcal{R}_{\vdots(o\kappa)(o\kappa)\ldots(o\kappa)}$. Either semantics could be used; they are isomorphic semantics. The 'f'-version was selected because it fits in with κ-transformation a little more easily; the neighbourhood semantics would require as well a κ-displacement in defining the relations assigned to constants. The adoption of the 'f'-version apparently however trivialises the translation of syntactic schemes into semantical postulates. But the uniform semantics are neither more nor less trivial than those given for sentential and quantification logics elsewhere; these semantics only appear deeper because the formal semantics differ by a further less obvious transformation from the syntax they model.

It is unnecessary to appeal to a neighbourhood, or "second-order", semantics in order to supply a universal semantics. A parallel "first-order" semantics can be given as ER shows; only such a theory is even more "twisted", i.e. interpretation rules even further removed from the natural ones.[1]

An S-model M for logic S on L is a basic S-model M which conforms to the semantical postulates for the axioms and rules of S (beyond those of logic B).

> A wff A holds at world a in S-model M iff $I(A)(a) = 1$; A is true in M iff A holds at T and false in M otherwise and M is a countermodel to A. Wff A is S-valid iff A is true in every S-model, and S-invalid otherwise.

It is extremely important that additional postulates be admitted in an unrestricted way (and not because the logics would be of less interest otherwise). For the syntactical constraints on a constant and the corresponding semantical requirements on its relation are what distinguish a constant from others of the same grammatical sort; and it is this way that the distinctive meanings of categorically similar constants is captured, namely through stacks of constraints which reflect its truth-conditions in all sentence frames.

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[1] ER as presented concerns extensional reduction. But it could readily be re-presented as showing referential reduction of any theory.

5. The soundness and completeness of S on L.

Theorem 1. For any logic S on L and any wff A, if A is a theorem of S then A is S-valid.

Proof is by induction over the length of the proof of A.

ad A1. Since by a lemma $I(A_\alpha) \in \nabla_\alpha$, and $I(A_\alpha) = I(A_\alpha)$ for an arbitrary S-model M, $\mathcal{T}I(A_\alpha)\ I(A_\alpha)(T) = 1$ by T1. But $I(Q_{(o\alpha)\alpha}) = \mathcal{T}$, whence $I(A_\alpha \equiv A_\alpha)(T) = 1$, i.e. (A1) is true in M.

ad A2. For arbitrary S-model M,

$$\begin{aligned} I((\lambda x_\gamma A_\beta)B_\gamma) &= I(\lambda x_\gamma A)I(B_\gamma) \\ &= I'(A_\beta), \end{aligned}$$

where I' is that x_γ-variant of I for which $I'(x_\gamma) = I(B_\gamma) \in \nabla_\gamma$. However $I(A_\beta[B_\gamma/x_\gamma]) = I'(A_\beta)$ where I' is as before. Hence $I((\lambda x_\gamma A_\beta)B_\gamma) = I(A_\beta[B_\gamma/x_\gamma])$. That A2 is true in M now follows as in the case of A1.

ad additional axioms of S. Suppose wff A is an axiom of S. Then for an arbitrary S-model M, the semantical postulate $I(A)(T) = 1$ holds; hence A is true in M.

ad R1. Suppose for arbitrary S-model M, $I(A_o)(T) = 1 = I(A_o \equiv B_o)(T)$.

By T1, $I(A_o) = I(B_o)$, whence $I(B_o)(T) = 1$ as required.

ad R2. Suppose for arbitrary S-model M, $I(A_\gamma \equiv B_\gamma)(T) = 1$ for every assignment in $x_{\alpha_1}^{(1)}, \ldots, x_{\alpha_n}^{(n)}$. By T1, $I(A_\gamma) = I(B_\gamma)$, for every assignment to the given variables. Then $I(C_\beta) = I(D_\beta)$ (by the quantificational semantical metalogic), whence as in the case of (A1), $I(C_\beta \equiv D_\beta)(T) = 1$, as required.

ad R3. Since x_γ is not free in C_β, x_γ occurs in wfp of C_β of the form $\lambda x_\gamma B_\delta$ in which variable y_γ does not occur. Then by rule Iiv, $I(\lambda x_\gamma B_\delta) = I(\lambda y_\gamma S^{x_\gamma}_{y_\gamma} B_\delta |)$. More generally, $I(C_\beta) = I(S^{x_\gamma}_{y_\gamma} C_\beta |)$ for arbitrary model M. Hence $I(A_o) = I(B_o)$, and the result follows as for (R1).

ad additional rules of S. Suppose for an arbitrary S-model M, the premisses of rule: $A_1, \ldots, A_n \rightarrow B$ are true. Then $I(A_1)(T) = 1 = \ldots = I(A_n)(T)$. Hence by the corresponding semantical rule $I(B)(T) = 1$. Whence B is true in M.

As usual, completeness requires some preliminaries. An S-theory a is a class of wff of language L closed under provable identity, i.e. if $A_o \in a$ and $\vdash_s A_o \equiv B_o$ then $B_o \in a$. Canonically K is the class of all S-theories.

Two wfp A_α and B_α are equivalent iff $\vdash_s A_\alpha \equiv B_\alpha$. In virtue of the identity postulates of S the relation is a congruence one which partitions the set of wfp with label α into disjoint equivalence classes $[A_\alpha]$, $[B_\alpha]$, ..., such that $[A_\alpha] = [B_\alpha]$ iff A_α is equivalent to B_α. That is, $[A_\alpha] = \{C_\alpha \in L : \vdash_s A_\alpha \equiv C_\alpha\}$ is well-defined.

$D_o = 2 = \{1, 0\}$;

$D_i = \{<[A_i], a>:$ A_i is a variable or constant of L and $a \in K\}$; but for a rigid semantics

$D_i = \{[A_i]:$ A_i is a variable or constant of L$\}$ for $1 \leqslant i \leqslant m$.

$D_{\alpha\beta}$ is then defined as before, as $D_{\alpha}^{D\beta}$. Canonically K is the class of all S-theories. Then $\mathcal{D}_\alpha$ is defined as before for each α.

A function Φ, mapping elements of $\{[A_\alpha]\}$ to $\mathcal{D}_\alpha$, for each α, is defined inductively as follows:

Basis 1. $\Phi[A_o]$ is that function in 2^K that maps $a \in K$ to 1 iff $A_o \in a$, i.e. $\Phi[A_o] = \lambda a C_F(A_o \in a)$, where C_F is the characteristic function. Evidently $\Phi[A_o]$ does not depend on the choice of A_o, since if $\vdash_S A_o \equiv B_o$ then $A_o \in a$ iff $B_o \in a$.

Basis 2. $\Phi[A_j]$ for $1 \leqslant j \leqslant m$, is that function in D_j^K which maps $a \in K$ to $<[A_j], a>$, which ordered pair serves to represent A_j at world $a \in K$, i.e. it provides the a-section of $[A_j]$. For a rigid semantics however $\phi[A_j] = [A_j]$.

Induction stage: $\Phi[A_{\alpha\beta}]$ is that (partial) function in $\mathcal{D}_{\alpha\beta}$ whose value for element $\Phi[B_\beta]$ of $\mathcal{D}_\beta$ is $\Phi[A_{\alpha\beta}B_\beta]$. Φ is here well-defined, for if $A'_{\alpha\beta}$ and B'_β are equivalent, respectively, to $A_{\alpha\beta}$ and B_β then $A'_{\alpha\beta}B'_\beta$ is equivalent to $A_{\alpha\beta}B_\beta$, by double substitution.

$\nabla_\alpha = \{\rho \in \mathcal{D}_\alpha : (PA_\alpha \in L)(\Phi[A_\alpha] = \rho)\}$. Thus $\rho_{\alpha k} \in \nabla_\alpha$ iff, for some wfp A_α, $\Phi[A_\alpha] = \rho_{\alpha k}$. Although Φ may only be partially defined on elements of $\{\mathcal{D}_\alpha : \alpha \text{ is a label}\}$, it is a total function on elements of $\{\nabla_\alpha\}$.

For $\delta = (\ldots((\beta\alpha_1)\alpha_2)\ldots\alpha_n)$, $a_k \in K$, and $\rho_{\alpha_i} \in \nabla_{\alpha_i}$, for each i in $1 \leqslant i \leqslant n$,

$$\mathcal{R}_{\kappa[\delta]}\rho_{\alpha_1}\ldots\rho_{\alpha_n}\alpha_\kappa = \xi w(PB_{\alpha_1}, \ldots, B_{\alpha_n})$$

$$[w = \Phi[A_\delta B_{\alpha_1}\ldots B_{\alpha_n}](a_\kappa) \ \& \ (Ui : 1 \leqslant i \leqslant n)(\Phi[B_{\alpha_i}] = \rho_{\alpha_i})],$$

where $\mathcal{R}_{\kappa[\delta]}$ corresponds to initial constant A_δ, i.e. $\mathcal{R}_{\kappa[\delta]} = \mathcal{R}^A_{\kappa[\delta]}$. That is, for constant A_δ and canonical valuation function v, $v(A_\delta) = \mathcal{R}_{\kappa[\delta]}$ where $\mathcal{R}_{\kappa[\delta]}$ is defined as above. Hence also $\mathcal{R}_{(j\kappa)} = \Phi[A_j]$.

The canonical S-model is the structure $M_c = <T, K, D, \nabla, v>$, where K is the class of S-theories, T is that S-theory containing exactly the theorems of S, D, ∇ and also Φ are defined as above, $v(A_\alpha) = \Phi[A_\alpha]$ for each initial variable A_α and $v(A_j) = \mathcal{R}_{\kappa[\delta]}$ as defined for initial constant A_δ.

Lemma 3. For every wfp B_β, $I(B_\beta) = \Phi[B_\beta]$.

Proof is by induction on the construction of B_β, and resembles the corresponding lemma in Henkin 50, except that the restriction to closed wfp is removed. Since logic S may contain no general method of universal closure the restricted method cannot be applied generally.

(i) If B_β is an initial variable with label β, $I(B_\beta) = v(B_\beta) = \Phi[B_\beta]$, by stipulation.

(iii) B_β is of the form $D_{\beta\gamma}C_\gamma$. By the induction hypothesis,

$$\begin{aligned} I(D_{\beta\gamma}) &= \Phi[D_{\beta\gamma}] \text{ and } I(C_\gamma) = \Phi[C_\gamma]. \text{ Moreover} \\ I(D_{\beta\gamma}C_\gamma) &= I(D_{\beta\gamma})(I(C_\gamma)) \\ &= \Phi[D_{\beta\gamma}](\Phi[C_\gamma]) \\ &= \Phi[D_{\beta\gamma}C_\gamma], \text{ by definition of } \Phi. \end{aligned}$$

(iv) B_β is of the form $\lambda x_\gamma C_\alpha$. By induction hypothesis $I(C_\alpha) = \Phi[C_\alpha]$.

Let $\Phi[A_\gamma]$ be any element of ∇_γ. Then the value of $\Phi[\lambda x_\gamma C_\alpha]$ for the argument $\Phi[A_\gamma]$ is, by definition of Φ, $\Phi[(\lambda x_\gamma C_\alpha)A_\gamma]$. Then according to (A2), $\vdash (\lambda x_\gamma C_\alpha)A_\gamma = S^{x_\gamma}_{A_\gamma}C_\alpha|$. Hence $[(\lambda x_\gamma C_\alpha)A_\gamma] = [C_\alpha[A_\gamma/x_\gamma]]$, whence $\Phi[(\lambda x_\gamma C_\alpha)A_\gamma] = \Phi[C_\alpha[A_\gamma/x_\alpha]] = I(C_\alpha[A_\gamma/x_\gamma])$ by the induction hypothesis. Thus the value of $\Phi[\lambda x_\gamma C_\alpha]$ for the arbitrary argument $\Phi[A_\gamma]$, i.e. $I(A_\gamma)$ applying the induction hypothesis again, is $I'(C_\alpha)$ where I' differs from I only in assigning to $I'(x_\gamma)$ argument $I(A_\gamma)$. Thus $\Phi[B_\beta]$ and $I(B_\beta)$ have the same value for every argument for which they are defined; hence, by extensionality of MS, they are identical.

(ii) B_β is A_γ, an initial constant with label $\gamma = (\ldots(\beta\alpha_1)\ldots\alpha_n)$.

Since for arbitrary $\rho_i \in \nabla_{\alpha_i} (1 \leqslant i \leqslant n)$ and $a_K \in K$

$$I(A_\gamma)\rho_1\ldots\rho_n a_K = \mathcal{R}_{K[\gamma]}\rho_1\ldots\rho_n a_K, \text{ it suffices to show}$$
$$\mathcal{R}_{K[\gamma]}\rho_1\ldots\rho_n a_K = \Phi[A_\gamma]\rho_1\ldots\rho_n a_K,$$

since equality then follows by extensionality. But in virtue of the definition of ∇, for each ρ_i, $1 \leqslant i \leqslant n$, $\rho_i = \Phi[D_i]$ for some wfp D_i. Hence it suffices to show

$$\begin{aligned} \mathcal{R}_{K[\gamma]}\Phi[D_1]\ldots\Phi[D_n]a_K &= \Phi[A_\gamma]\Phi[D_1]\ldots\ [D_n]a_K \\ &= \Phi[A_\gamma D_1\ldots D_n]a_K, \text{ by definition of } \Phi\text{-composition.} \end{aligned}$$

However, by definition of $\mathcal{R}_{K[\gamma]}$,

$$\begin{aligned} \mathcal{R}_{K[\gamma]}\Phi[D_1]\ldots\Phi[D_n]a_K &= \xi w(PB_1, \ldots, B_n) \\ &[w = \Phi[A_\delta B_1\ldots B_n]a_K \ \&\ (Ui : 1 \leqslant i \leqslant n)(\Phi[B_i] = \Phi[D_i])] \end{aligned}$$

But $\Phi[B_i] = \Phi[D_i]$ iff $\vdash_s B_i \equiv D_i$; and given $\vdash_s B_i = D_i$, $\Phi[A_\delta B_1\ldots B_i\ldots B_n] = \Phi[A_\delta B_1\ldots D_i\ldots B_n]$ by substitutivity of identicals. Hence by iteration of these steps from $i = 1, \ldots, i = n$,

$$\begin{aligned} \mathcal{R}_{K[\gamma]}\Phi[D_1]\ldots\Phi[D_n]a_K &= \xi w[w = \Phi[A_\delta D_1\ldots D_n]a_K] \\ &= \Phi[A_\delta D_1\ldots D_n]a_K, \text{ as required.} \end{aligned}$$

Corollary: $I(A_o)(a) = 1$ iff $A_o \in a$
iff $\Phi[A_o](a) = 1$

Proof. In view of the lemma, it suffices to show $\Phi[A_o](a) = 1$ iff $A_o \in a$.

But this follows at once by the definition of $\Phi[A_o]$.

Lemma 4. The canonical S-model M_c is an S-model.

Proof. The main details have already been furnished. As to the remainder:

ad(T1), i.e. to show $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$ iff $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Firstly, suppose $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Let C_α be a wfp such that $\Phi[C_\alpha] = \rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$. Since $\vdash C_\alpha \equiv C_\alpha$, $C_\alpha \equiv C_\alpha \in T$. Thus $I(C_\alpha \equiv C_\alpha)(T) = 1$, i.e. $(I(Q)I(C_\alpha))I(C_\alpha)(T) = 1$, i.e. $(\Phi[Q]\Phi[C_\alpha])\Phi[C_\alpha](T) = 1$. Hence $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$. Conversely, if $\mathcal{T}\rho_{\alpha\kappa}\sigma_{\alpha\kappa}T = 1$,

$$1 = \xi w(PB_\alpha, C_\alpha)(w = \Phi[QB_\alpha C_\alpha](T) \ \&\ \Phi[B_\alpha] = \rho_{\alpha\kappa} \ \&\ \Phi[C_\alpha] = \sigma_{\alpha\kappa}).$$

Thus for some B_α, C_α, for which $\Phi[B_\alpha] = \rho_{\alpha\kappa}$ and $\Phi[C_\alpha] = \sigma_{\alpha\kappa}$,

$$1 = \Phi[QB_\alpha C_\alpha](T), \text{ i.e. } (\Phi[Q]\Phi[B_\alpha])\Phi[C_\alpha](T) = 1,$$
$$\text{i.e. } (I(Q)I(B_\alpha))I(C_\alpha)(T) = 1, \text{ i.e. } I(B_\alpha \equiv C_\alpha)(T) = 1.$$

Hence $\vdash B_\alpha \equiv C_\alpha$, and so $\Phi[B_\alpha] = \Phi[C_\alpha]$. Thus $\rho_{\alpha\kappa} = \sigma_{\alpha\kappa}$.

ad(∇i) and (∇iii). More generally, $I(A_\alpha) \in \nabla_\alpha$. For $I(A_\alpha) = \Phi[A_\alpha]$. But $\Phi[A_\alpha] \in \mathcal{D}_\alpha$, by characterisation; and $\Phi[A_\alpha] = \Phi[A_\alpha]$, so $\Phi[A_\alpha] \in \nabla_\alpha$.

ad(∇ii). $\rho \in \nabla_{\alpha\beta}$ iff $\rho \in \mathcal{D}_{\alpha\beta}$ and, for some wfp $A_{\alpha\beta}$, $\rho = \Phi[A_{\alpha\beta}]$, i.e. iff $\rho \in \mathcal{D}_\alpha^{\mathcal{D}_\beta}$ and for a given $A_{\alpha\beta}$ ρ is that function in $\mathcal{D}_\alpha^{\mathcal{D}_\beta}$ whose value for an element $\Phi[B_\beta]$ of $\mathcal{D}_\beta$ is $\Phi[A_{\alpha\beta}B_\beta]$ of $\mathcal{D}_\alpha$, i.e. whose value for element $\Phi[B_\beta]$ of ∇_β is $\Phi[A_{\alpha\beta}B_\beta]$ of ∇_α. Hence $\rho \in \nabla_\alpha^{\nabla_\beta}$, since $\Phi[B_\beta]$ is an arbitrary element of ∇_β.

Theorem 2. For any logic S on L and any wff A of S, if A is S-valid then A is a theorem of S.

Proof. Suppose A is not a theorem of S. Then A does not belong to the base T = L of the canonical S-model M_c. Since $A \notin T$, interpretation I on M maps A to 0, i.e. $I(A)(T) \neq 1$. Hence A is not S-valid.

Corollary (I). Every logic on a λ-categorial language (system formulable as a logic on such a language) has a two-valued worlds semantics.

The result is immediate from Theorems 1 and 2.

Corollary (II). Every λ-categorial language has a two-valued worlds semantics.

For let T be the truth-logic on L formulated by adding to B as axioms the set of wff of L that are true. Then T has a two-valued worlds semantics, and so therefore does the language.

Corollary (III). (Essentially Cresswell's conjecture, 73, pp.89-90).

For every fully λ-closed set Γ of wff (sentences) of L (or of L'), there is a model <T, K, ∇, v> which is characteristic for Γ, i.e. for every wff (sentence) A, $A \in \Gamma$ iff $I(A)(T) = 1$ where I is the interpretation associated with valuation v. (A set Γ of wff is λ-closed iff every wff which results from elements of Γ by rules of λ-conversion or of identity belongs to Γ, and fully Γ-closed if in addition it contains a wfp of the form $A_\alpha \equiv B_\alpha$ for every α).

For take Γ as axioms of a logic on L (or L').

Corollary (IV). Every many-valued logic on L (system formulable as a logic on L) has a two-valued worlds semantics. (This result comprehends all present many-valued logics with (finitary) languages.)

For reformulate the logic as a logic on L, and apply (I).

Corollary (V). (Carnap's thesis of extensionality). For any non-extensional system (in the sense of a fully λ-closed set of wff) formulable on a λ-categorial language there is an extensional system Γ' into which Γ can be logically translated, i.e. for $A \in \Gamma$ there is a wff $A' \in \Gamma'$ such that A and A' are logically equivalent (see, e.g., Carnap [16], p.141).

For define A' as I(A)(T) and Γ' as $\{A' : A' = 1\}$; then applying (III), $A \in \Gamma$ iff $A' = 1$ iff $A' \in \Gamma'$, as required. In short, I serves as a general translation function, to be specified at world T. Since the semantical metalanguage MS is extensional, as already argued, the result is established.

Carnap's thesis does not of course imply the reducibility of intensional discourse to extensional.

Corollary (VI). Every (philosophical) theory formulable in a λ-categorial language has a semantical analysis. Thus exact theories of universals, propositions, belief, and so on, will have such analysis.

Corollary (VII). Every logic U whatsoever (i.e. no basic logic such as B is assumed) on a pure categorial language L, i.e. a categorial language without conditions on λ, has a two-valued world semantics.

Soundness is a special case of Theorem 1, but completeness requires new details. A U-theory is any class of wff of the language L; and K is canonically the class of all U-theories. For the rest $[A_\alpha]$ is equated with A_α and $\Phi[A_\alpha]$ with $\Phi(A_\alpha)$. Thus

∇_α is $\{\rho \in \mathcal{D}_\alpha : (PA_\alpha \in L)\Phi(A_\alpha) = \rho\}$ and

$\mathcal{R}^A_{K[\delta]}$ is $\lambda\rho_{\alpha_1} \ldots \lambda\rho_{\alpha_n}\ \lambda a\ \xi w(PB_{\alpha_1}, \ldots, PB_{\alpha_n})$

$[w = \Phi(A_\delta B_{\alpha_1} \ldots B_{\alpha_n})(a)\ \&\ (Ui : 1 \leqslant i \leqslant n)\Phi(B_{\alpha_i}) = \rho_{\alpha_i})$;

and Lemma 3 establishes that for every wfp B_β, $I(B_\beta) = \Phi(B_\beta)$. But apart from the replacement of square brackets by round ones, and the omission of special steps for λ the completeness argument goes through as before.

6. Widening the framework: towards a truly universal semantics. There are several good grounds for doubt as to the adequacy of result (I) as a basis for thesis

HI. Every logic on every language has a two-valued worlds semantics,

which is presumably what a universal semantics should show.[1] In this section simple enlargements of result (I) are made, with a view to removing the grounds for these doubts; then HI is established under certain, widely accepted, assumptions. Thus a beginning is made on the task of building λ-

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[1] (Footnote on next page).

categorial languages and their semantics into more adequate vehicles for natural language analysis.

A. Removing the Limiting Effect of Basic Logic B.

Firstly, the auxiliary connective ≡ can be eliminated (in effect relegated to MS) and B replaced by a basic logic C of pure λ-conversion. The rules of logic C are just the rules of λ-conversion of Church 40, p.60; namely, R3, bound variable change, and

RC. Where D_o results from C_o by replacement of any wfp $((\lambda x_\gamma A_\beta)B_\gamma)$ by $A_\beta[B_\gamma/x_\gamma]$ or conversely, then if C_o is a theorem so is D_o. (λ-conversion rules)

Result (I) extends to logics which include C as basis in place of B. The semantics is as before except that T need not occur and T1 is of course not required. Soundness is provided along the same lines as before: the case of RC illustrates the main detail.

ad(RC). For arbitrary model M, $I(A_\beta[B_\gamma/x_\gamma]) = I((\lambda x_\gamma A_\beta)B_\gamma)$, as shown in verifying (A2) in the case of logic B. But then $I(C_o) = I(D_o)$, whence, as $I(C_o)(T) = 1$, $I(D_o)(T) = 1$.

For completeness, a relation conv which does the work of provable identities is defined, thus:

> conv is the least Leibniz identity relation on subscripted wfp of S, i.e. equivalence relation which guarantees full substitutivity (as for R3), such that $((\lambda x_\gamma A_\beta)B_\gamma$ conv $A_\beta[B_\gamma/x_\gamma]$ and $S^{x_\gamma}_{y_\gamma}C_\beta|$ conv C_β, where x_γ is not free in C_β and y_γ does not occur in C_β.

Upon replacing $\vdash_s A_\alpha \equiv B_\alpha$ uniformly by A_α conv B_α, the completeness argument is as before. Thus an S-theory a is a class of wff closed under conv, i.e. if $A_o \in a$ and A_o conv B_o then $B_o \in a$; and A_α and B_α are equivalent iff A_α conv B_α. A corollary of the extended (I) is Cresswell's conjecture:

Corollary (VIII). Every λ-closed set Γ of wff of L (or of L') has a characteristic model <T, K, ∇, v> (and hence has a characteristic Cresswell model $<\underline{\underline{D}}, \underline{\underline{T}}, V>$ in which V = v, $\underline{\underline{T}}$ = T, and in which the domains of $\underline{\underline{D}}$ need not be stratified; cf. 73, pp.74-99).

It is certain, however, that λ-conversion does not apply within quotational linguistic contexts, and decidedly dubious that it operates

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[1] (Footnote from previous page).

HI, which has as a corollary that every natural language has a many-valued worlds semantics, follows from (I) given a translation thesis of the form

H. Any logic on any language may be reformulated, preserving requisite semantical properties, as a logic on a (free) λ-categorial language.

Thesis H raises, however, vexatious questions as to the structure of language in general - questions Wittgenstein 53 tried to talk us out of asking, but which can now be answered quite generally in the case of what are called 'formal languages'.

within more highly intensional linguistic contexts.

Fortunately, secondly, the general requirement that λ-conversion holds everywhere can be relaxed. Divide the structure labels of language L into two classes, the SA (or substitution admitting) labels and the $\widehat{SA}$ labels, subject to the requirements:

(i) $0 \in SA$;

(ii) $\alpha, \beta \in SA$ iff $(\alpha\beta) \in SA$.

The impact on the postulates of logics B and C is as follows: A1 attracts the rider 'for $\alpha \in SA$' and A2, R2 and RC the rider 'for $\beta, \gamma \in SA$'. The upshot is that there are linguistic frames in which λ-conversion and structural identity substitution are not permitted, notably those which have associated with them labels not in SA. The method enables the treatment of quotation within logics on λ-categorial languages, in this way for example. Suppose label 7 does not belong to SA, and let (type-) sentence quotation be represented by a pair of functors, $Qu_{(70)}$ and $Ct_{(17)}$, with 'A_o' $=_{Df}$ $Ct_{(17)}(Qu_{(70)}A_o)$. (Alternatively, one functor could operate on the expression plus right quote and then the other on the left quote and the resultant, somewhat like Dirac's bras and kets.) It follows that the logic does not legitimise substitutions and conversions within quoted wff.

Result (I) and its corollaries hold for logics on these extended λ-categorial languages, once the semantical analysis is adjusted. The main change concerns interpretation rule Iiv, which is amended thus:

Iiv'. Where A_δ has the form $(\lambda w_\beta B_\gamma)$ and $(\gamma\beta) \in SA$, $I(\lambda w_\beta B_\gamma)$ is defined as before, i.e. as in rule Iiv, but where $(\gamma\beta) \notin SA$, $I(\lambda w_\beta B_\gamma)$ is some (arbitrary) element of $\nabla_{(\gamma\beta)}$.

Where the basic logic is B, T1 holds subject to the proviso: $\alpha \in SA$. These adjustments take care of the soundness part of (I), but completeness requires a further adjustment: though $\Phi[A_\alpha]$ is defined as before where $\alpha \in SA$, for $\alpha \notin SA$, $\Phi[A_\alpha] = A_\alpha$, as in the case of U logics on pure categorial languages.

Henceforth it is assumed that logics on λ-categorial languages include those on extended λ-categorial languages, perhaps without a structural identity. Observe that the restriction to lambda-categorial languages has been substantially lifted; and by labelling the remaining restriction R3 can be removed.[1]

B. Removing the Restriction to Categorial Languages: Method 1.

It may be that only a (recursively enumerable) subclass of wff of a categorial language is grammatical, or, equivalently, that the class of grammatical sentences of a language is embeddable in a categorially-determined class of wff.

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[1] The logical theory may be enlarged in other ways as well. In particular, the conditions on structure labels of free λ-categorial languages may be further relaxed, by introducing, following Rennie, an ordering relation on structure labels. In this way the universal theory can directly encompass both transfinite type theories, such as that of Andrews 65, and the very substantial enlargements on what can be said in type-theoretical languages incorporated in Rennie's unpublished work. Also the theory may be made polyvalent, to take due account of such values as non-significance and, perhaps, incompleteness. And its generality can be demonstrated; e.g. it can be shown to include all quantificational devices.

A logic U is initially formulable as a logic on a λ-categorial language L iff U is representable by a structure $<P, F, \mathcal{K}, \mathcal{R}>$ where P is the set of symbols of L, F the set of U-wfp (or of significant phrases) is a (recursively enumerable) subset of the set of wfp on P, and $<\mathcal{K}, \mathcal{R}>$ is a logic on L (as previously defined), and further $\mathcal{K} \subseteq F$ and if the premises of a rule of $\mathcal{R}$ are in F so is the conclusion. Thus F is a supertheory of the theory T of theorems of U, and can be modelled in the same way as T. A logic is formulable as a logic on a λ-categorial language L iff it is (recursively) re-expressible as a logic which is initially formulable on L. Theorems 1 and 2 and their enlargements and corollaries extend (in a way that has already been allowed for in the statement of corollaries) to logics formulable on λ-categorial languages.

While these shuffles can help in solving the excessive width problem of systems on λ-categorial languages, that too many expressions get through as well-formed, they do nothing to meet the excessive narrowness problem, already discussed, that λ-categorial languages appear to rule out as ill-formed, or at least as radically ambiguous, perfectly admissible expressions of natural languages. The method thus far does not resolve, then, the question of a universal semantics for every logic on every language. To bring method 1 to fruition it will have to be combined with some liberalisation of extended λ-categorial languages.

C. Solving the Fundamental Problem by Free λ-Categorial Languages?

λ-categorial languages are next extended, with a view to escaping the fundamental adicity problem, by allowing the assignment to constants not just of a single structural label, but perhaps of a multiplicity of labels. Just this appears to happen, at first glance anyway, in natural language grammars. For example, the adverb 'slowly' modifies verbs of different adicities and has, prima facie, the labels (01)(01),((01)1)((01)1), (((01)1)1)(((01)1)1), etc. Should one try, amateurishly, to write down phrase structure rules for English a similar phenomenon quickly emerges; e.g. an adjective is assigned different structural labels, (22) or 1 (or possibly (01)((01)1) or possibly a new label 5) accordingly as it occurs attributively or predicatively. Allowing for more than one label for given constants circumvents these problems, and also enables us to say what we do say, that the one constant, 'water' for instance, can function in a multiplicity of ways - as

(i) a sentence, whether as a question, order, assertion, depending on the context;

(ii) a subject as in 'water is here';

(iii) a common noun as in 'The water is hot';

(iv) a verb as in 'I water the garden' or 'My eyes water'.

In short such freedom appears as a fundamental feature of natural languges, in contrast to prevailing formal ones, and hence the "fundamental problem".

It may be that in giving way to this natural language licence non-ambiguity conditions (e.g. condition (v) of Section 1) are violated. If so this is a small price to pay: what is crucial is that the desirable flexibility of natural languages is gained without sacrificing the important functionality features of λ-categorial languages.

Allowing for multiple labelling of constants severs the link with type theory. For though the same constant can carry several labels, one and the same *thing* cannot be (even variously) a truth value or proposition, an individual, a class, etc., in the crazy way that would be required to maintain the parallel between linguistic theory and thing interpretations. Free λ-categorial systems force the linguistic interpretation.

To allow for multiple labelling of each constant, the formation rules of L are amended as follows:

(2) Countably-many constants:

C, D, Q, a, b, C(1), D(1), ...

each of which has (finitely-) many (and at least one) structural labels associated with it.

Then a constant alone with *one* of its associated structure labels is a wfp, e.g., where A is a constant and α is one of its labels then A_α is a wfp. Otherwise the rules are as before. Thus A_0 is a wff if it is well-formed for *some* labelling of its constants.

The semantics is correspondingly adjusted. A constant A is assigned *one relation* $\mathcal{R}^{A}_{K[\alpha]}$ by (v2) *for each associated label* α, i.e. A has associated with it by v a set of relations, corresponding to its set of labels.

Otherwise everything works as before. In particular, since inductive clauses have not been interfered with but only bases clauses, soundness and completeness follow as before. Accordingly corollaries (I)-(VII) generalise to systems formulable on free (extended) λ-categorial languages.

Method (1) can accommodate any (finitary) formal language when (2) is combined with (3). For all finite strings of symbols drawn from a finite vocabulary can be represented in free (λ-categorial languages, and any subset of the set of strings can be picked out by way of a predicate G. Also any phrase structure rewrite rule: $\phi \rightarrow \psi$, can be represented in the logic: $G\phi \rightarrow G\psi$. Then $\mathcal{F} = \{A : GA\}$. Hence HI is established for every (finitary) formal language, i.e. for every language in the standard sense (as set out, e.g. in Kimball 73).

D. Method 2: the Addition of Transformations

Despite the promise of method 1, which in its unembellished form would do away with reductions to canonical form and which may indeed be adequate for natural language analysis, linguists now prefer the method of reduction to canonical form by way of transformations. It is evident that unless method 1 is applied, and grammatical sentences distinguished from wff, categorial languages will be far from universal. For every categorial (λ-categorial) language is a context-free language (as is easily shown by converting the formation rules into rewrite rules); and context-free languages form only a proper subclass of formal languages. (Moreover even if natural language grammar is context-free, sentence significance is not a context-free matter but is context-sensitive: see Slog, Chapter 4.) Similarly free λ-categorial languages, which in effect simply duplicate the constants of λ-categorial languages, are context-free languages, and thus hardly universal. Yet for universal semantics the logics considered must be built on universal languages.

The addition of transformations, however, enables the whole class of formal languages to be comprehended.

Lemma 5. Every recursively enumerable language (unrestricted rewriting system) is generated by some free categorially-based transformational grammar (which meets the conditions on recoverability of deletions and which uses filter and postcylic transformations - call these admitted transformations). (The terminology is that of Kimball 67; for valuable background see Peters and Ritchie 73.)

Proof follows from the propositions

(a) Every recursively enumerable language is (weakly) generated by some regular-based transformational grammar (with the requisite features);

and

(b) The (weak) generative capacity of free categorial grammars includes that of regular grammars.

Proposition (a) is the main result of Kimball 67. To prove (b) it suffices to show that each right-branching regular grammar G can be represented as a free categorial grammar. The rewrite rules of G are exclusively of the form $\alpha \rightarrow C\beta$ and $\alpha \rightarrow A$. The rules of a categorial grammar take the form $\alpha \rightarrow (\alpha\beta)\beta$ and $\alpha \rightarrow A$, where A has label α; for structure labels can be construed as nonterminal symbols. In a free grammar the restriction that A has label α can be removed. Thus it is enough to show that rules of the form $\alpha \rightarrow C\beta$ can be represented. But such a rule is supplied by the rules $\alpha \rightarrow (\alpha\beta)\beta$ and $(\alpha\beta) \rightarrow C$ in combination.

Actually Kimball's work 67, p.195) also establishes the universality of Montague's universal grammar, and sharply delimits the class of relations required in linking disambiguated languages with (finitary) languages in general (to the class of Chomsky transformations which also allow any transformation to write in the output tape one of a finite list of markers). Thus the class of finitary Montague languages of 70 coincides with the class of unrestricted rewriting systems. But really much more control over the admissible class of transforming relations is required. For, as it is, the base grammar can cease to make a distinctive contribution, all the generality being gained through the transformations: yet the superiority of categorially-based grammars is supposed to lie precisely in the ability of the base to reveal and control language structure.

Just one assumption is now required to complete the proof of HI, but it is a large one, namely a version of the Katz-Fodor hypothesis that transformations preserve meaning.

Let L_1 be any recursively enumerable language and S_1 any logic on L_1 (for simplicity S_1 can be construed as a subset of L_1). By lemma 5, there is a free λ-categorial language, L_2 say, from which L_1 is generated by transformations, T say, and there will also be a subset, S_2 say, of L_2 which generates S_1 by (some subset of) T. Then the hypothesis is, in precise form,

TH. The semantics of S_1 on L_1 is the same as the semantics of S_2 on L_2.

Thus, since S_2 on L_2 has a two-valued worlds semantics, so does S_1 on L_1.

Theorem 3. [Given the Katz-Fodor hypothesis (in form TH)] every logic on every recursively enumerable language has a two-valued worlds semantics.

Hence HI is established for all formal languages, on the assumption TH. And so long as the transformations in T simply rearrange wfp, delete repetition and suchlike, TH is not implausible. But it is possible to delete the assumption TH altogether, and to prove HI directly, as method one reveals.

7. Allowing for context-dependence in the semantical evaluation. It is a truism - though one inadequately noted in theories of language - that context-dependence is a pervasive feature of natural language analysis. The context-dependence of language components may be taken account of either syntactically or semantically (as Slog, section 7.2 explained); and where it is done semantically, as is here supposed, there are isomorphic ways of doing it. Most simply the set of worlds K can simply be reconstrued as the cross-product of worlds and contexts W x C, and thus semantical evaluations with respect to worlds replaced by evaluations with respect to a world-context pair (as in Slog). Alternatively, since $D_i^{W \times C}$ corresponds to $(D_i^W)^C$ and also (under a different mapping) to $(D_i^C)^W$, the semantical analysis provided above can be regarded as giving a functional analysis to be completed by application to a context (somewhat along the lines of Cresswell 73 in the latter case); e.g. to complete I(A)(a) it is applied to an element of c of C yielding I(A)(a)(c) as a completely assessed expression.

For a semantics for S on L which allows for context-dependent evaluations (which will show up in the specific rules given for personal pronouns, egocentric particular terms, and so on), S-models are complicated by replacing K by the pair (W, C). Thus a basic S context-model is a structure $M = \langle T, W, C, D, \nabla, v \rangle$ where W is a set of worlds and C is a set of contexts (a context being given, as in Slog, by a certain set of statements). Then on the simplest method K is defined as W × C and the remainder of the definition of M, and indeed everything else, is as before; soundness and completeness results extend automatically.

For the isomorphic semantics there is a little more work. For example, in the $(D^W)^C$-form, the *D* functions are defined thus: $\mathcal{D}_j = (D_j^W)^C$ for $1 \leqslant j \leqslant m$; $\mathcal{D}_{\alpha\beta}$ is as before. Completeness can be obtained by exploiting the isomorphism, e.g. for c in arbitrary index set C,

$$\Phi[A](a)(c) = 1 \text{ iff } A \in (a, c).$$

8. Applying the semantical theory to yield semantical notions: the two-tier theory. A universal semantics of the sort given provides a basis and framework for the main components of what is commonly called a theory of meaning. However it does not provide the theory, but only the framework. To obtain satisfactory theories of synonymy and sense and of entailment and propositional identity, for example, further construction work has to be done. A general theory of meaning and of intensional notions, is, to continue the metaphor, a necessary superstructure which fits onto and completes the theory of truth. But the superstructure can have many different designs even when the truth substructure is already determined.

There are many previous engineers who have observed the main structural principles and designed their edifices accordingly - Wittgenstein, Tarski, Carnap, Kemeny and Montague to mention some of the most important innovators among them. All these semantical engineers have been seriously hampered both by inadequacies in the truth substructures on which they based their superstructure designs - either by the inadequacies of the languages they considered to the discourse that has to be accounted for, or, more important in the case more adequate languages, by the limitations of their semantical apparatus, in particular again the limitation to possible worlds and to consistent theories - and by severe limitations in superstructure technology, especially that supposed to take care of higher level intensional notions such as synonymy and meaning which typically got treated as if they were modal notions - indeed in leading designs the significantly different levels of intensionality have all been collapsed to the initial modal level. These inadequacies in previous designs can now be overcome: this provides one of the excuses for the newer and more elaborate plans sketched here: of course the newer plans - which still remain far from perfect - have tried to take advantage of the virtuous features of earlier designs, and especially the work of Kemeny 56.

The new design is of a two-tier construction with the second, model, tier largely a copy of the first, world tier. In a discriminating general semantical theory (of the sort RLR, chapter 14 is intended to represent) the worlds or situations are classified, semantically important worlds or classes of worlds being separated out. For example, the base or factual world T of a model M, the world at which truth in M is assessed, is distinguished among the regular worlds, those of class O, of M. The regular worlds are in turn a subclass of the normal worlds, i.e. O ∈ K. Thus far the structure of M, with components T, O, and K, is simply that adopted in semantical analyses of relevant implication and entailment; but for the analysis of higher levels of intensionality than modal and entailmental levels further classes of worlds enter the picture, in particular the class W of all worlds and also certain regular featuring subclasses of W. Thus a general model of M takes the structural form <T, O, K, W, ..., I> - the exact or final form of the first tier M will not matter for the theory to be outlined - with I a valuation or interpretation defined on initial formulae of the language and on worlds and contexts. Function I may also supply relations on worlds for each constant of the language, or such relations may be independently supplied by the model structure. (The model of p.315 is thus complicated and relettered.)

In the universal semantics given, upon an elaboration of which the two-tier theory builds, there are essentially two stages in determining a model:

(i) The general framework of assignments for each initial formula is set up;

(ii) Modelling conditions are imposed to ensure that every theorem is true in the model.

This is achieved in the elaborated semantics presupposed by requiring that the modelling conditions corresponding to each axiom and to each rule hold for each world a in O. For the two-tier theory stages (i) and (ii) are separated, and frameworks or basic models which satisfy (i) but perhaps not (ii) are also considered. In other words, a framework is like a model except that it may not conform to the modelling conditions imposed. (In the general extensional case studied by Kemeny 56, frameworks are called semi-models.)

The universal semantics defines, for every framework and every world or world-context pair b of that framework, an interpretation I(A, b) for every wff in sentence A of the language under investigation; I(A, b) has one of the values I (holds) or 0 (does not hold) - or, on the significance enlargement of the semantical theory, which will be allowed for, n (does not significantly hold). Relative to a framework M, truth is holding at the base world T of the framework, i.e. A is true in M iff I(A, T) = 1; and non-significance is failing to hold significantly at T, i.e. A is significant in

M, iff $I(A, T) \neq n$. Neither truth nor significance are so far defined in an absolute, i.e. a framework-independent, way. The absolute notions defined in the universal semantics, like those of logic textbooks expounding the routine semantics of quantification theory, are validity, i.e. truth in every model, and satisfiability, i.e. truth in some model: not truth or designation or any of the intensional notions a really general theory should explicate.

That is to say, by way of summary, the universal semantics does not, on its own, provide satisfactory metatheoretic analyses of any of the main terms usually listed as belonging to the theories of meaning and reference without further - and, as it turns out, problematic - ado. What are characterised in a model-independent way in such semantics are such notions as validity and satisfiability, not even such central semantical notions as meaning or truth. Admittedly the semantics does define, or allow one to define, truth and meaning in a model-relative fashion; for example, in the course of defining validity of a statement in the universal semantics truth in a model is defined, as holding in the base world of the model.

But what is required to define truth itself is a distinguished (basic) model. For once a real, or factual, model M is distinguished among the class of models truth is readily definable in terms of holding in the base world of the real model, i.e. A is true if $I(A, T) = 1$, where T is the base world of M and I is the interpretation function of M. Similarly, given a real model, meaning can be defined as a function on it, more specifically as a function from worlds and contexts of the real model to values in the appropriate domains of the model. Observe, moreover, that the role of M (or sT, in a more revealing way of writing it) in the class of models sW is like that of base world T in class W.

It soon appears that other model-theoretic analogues of worlds are going to be needed, a class sO of regular models, or interpretations, in order to define necessity, possibility and other modal notions in an absolute way, a class sK of normal models to define entailment absolutely, and so on. Such a classification of models already appears in a rudimentary form in Kemeny, where interpretations, sO, are a proper subclass of semi-models, sW, and a real interpretation, as is distinguished in sO. Such a truncated classification is however quite inadequate for proper characterisation of more highly intensional notions; for these a fuller second tier, with more discriminatory power, is wanted.

The idea of the two-tier theory is this: firstly, that a second tier can be constructed, that models can be classified along the plan of the classification of worlds and secondly, that given this classification, absolute notions can be defined in much the way that model-relative notions have been defined. Corresponding to models there are, then, realisations (to assign an old term an appropriate new role): a realisation sM is a structure of the form <sT, sO, sK, sW, ...>: it is the second tier. Given that sW has already been characterised by the universal semantics, there are two main problems in obtaining satisfactory absolute characterisations of such notions as truth, entailment and meaning: (1) devising appropriate definitions in terms of elements of sM - a task already accomplished for several important lower level notions - and (2) characterising the appropriate elements of sM on which the definition depends, e.g., sT in the case of truth, sO for analyticity, and sK for entailment. Attempting to solve these problems for specific semantical notions will be the primary objective of subsequent sections.

In view of the philosophical and semantical importance of many of the notions for which the characterisation problems arise, it is surprising that it is sometimes said, e.g. by Cresswell (76, p.204), that all that is required of semantics is to furnish a theory of interpretation, i.e. of valuation functions at each index in every model. Required for what? one is inclined to ask. It is certainly not good enough for philosophical purposes, for the model-independent accounts of truth, propositional identity, sense, and so on, which are expected to flow from an adequate semantical theory. It should transpire, however, that a suitable theory of interpretation when supplemented - notably by a model-independent definition of truth and by the elements of (1) above - does supply everything. Elsewhere (73 in particular) Cresswell himself is concerned to offer semantical analyses of synonymy and propositional identity, so his claim is perhaps best read contextually, as a criticism of the way in which others (e.g. Montague 74) have gone about setting up their theories of sense and synonymy - as if some sort of Fregean sense-reference theory really had, despite its manifold defects, to be incorporated into the semantical scheme of things.

Much more emerges, however, from the claim that all that is required of a semantics is a theory of interpretation. Firstly, insofar as the semantical theory aims to be appropriately general, and to encompass semantically closed natural languages, a serious dilemma arises. The reason is that among the specific terms to be analyzed, and for which a theory is required, are such terms as sense and synonymy, i.e. what is said not to be required is required. But, secondly, these analyses are of terms within the language, whereas the usual analyses are of metalinguistic terms. This raises the question - closed off by Tarski (44 and 56) and Carnap MN but recently reopened with the readmission of semantically closed languages - as to what the semantical enterprise should be about, whether it should be of terms within the language or should be of metalinguistic terms. The study of entailment has made the answer clearer: there should be analyses of both sorts, and where the object language contains a satisfactory entailment connective there should be agreement between the object language notion and the metalinguistic analysis, e.g. $\vdash A \Rightarrow B$ iff that A entails that B. This illustrates the fundamental principle of tier agreement, which will be applied repeatedly in obtaining metalinguistic analyses from systemic ones.

Should the structures of the levels of language theory be observed in the metalinguistic case, the analysis of the object language notion will be more comprehensive than that of the metalinguistic analysis; for the semantical analysis of the systemic notion has to account for iterated occurrences, of the entailment connective, whereas the analysis of the metalinguistic relation is essentially only a first-degree matter, that is iterated occurrences need not be accounted for. In what follows the analyses proposed and examined will be metalinguistic ones; but these should be regarded only as a prelude to more complex analyses of systemic notions. The larger and quite essential undertaking is supposed, of course, to encounter insuperable obstacles, deriving from the semantical paradoxes and their like: such analyses are said to immerse us in inconsistency and in all the problems of semantically closed languages (for a recent statement of this Tarskian position, see Chihara 76). However the fact is that many semantically closed languages - natural languages in particular - are perfectly in order logically as they are (cf.UL, which meets the criticisms of Chihara 76).

With a genuinely universal semantics we do have all that is said to be required of semantics in the narrow sense - for though we are far from having satisfactory semantical analyses for a great many natural language constructions, we do possess a universal theory which furnishes adequate modellings for a very wide class of languages. In this respect the situation is not dissimilar from that in many other areas: for example, we have a general meteorological theory (which consists essentially of an assemblage of aerodynamical and thermodynamic laws) but we are unable, for several reasons, to apply it in very many concrete cases, especially those of weather prediction; and likewise we have a universal theory of optimisation which however can only be applied in some very special cases, often because we lack the extra information required to apply it elsewhere. With the universal semantics it is much the same: we lack the further details for fitting specific constructions and terms within the general framework; and this implies too that often we do not really know how general the general framework needs to be for specific languages. That is to say, a narrower class of modellings of languages than the universal one may suffice for specific languages and classes of them; the universal theory may be a lot more general than need be, or is desirable, for handling them. A simple example is provided by the class of normal Lewis modal logics: although the universal semantical theory grinds out semantics for these logics, some of the apparatus used is unnecessary, and simpler and more informative relational (Kripke) semantics can be provided in every case of interest.

But in a proper wider sense, a "universal" semantics has to solve the characterisation problems for the main semantical notions.

9. The problem of distinguishing real models. A serious but curiously neglected problem is how to determine or select - or to avoid selecting - a model in terms of which truth and meaning can be defined in a model-independent way. There are various strategies, some of them rather devious, that have been tried. For example, Leibnitz can be taken as proposing that one choose the best possible model, an optimisation recipe that gets transformed in modern work to the more subjective proposal that one choose the preferred; Kemeny (56, p.2) invites the author of a system to select a model or (later, p.8, in more strong-arm fashion) insists that he supply such a model; Tarski (in 56 and elsewhere) and Carnap (e.g. in MN) require that a translation of the object language into the metalanguage, be supplied; Cresswell (73, p.38 ff), adapting Wittgenstein 47, supposes that we are given some model built from a set B of "basic particular situations".

It emerges from the case of truth definitions that none of these strategies is without substantial difficulties. A first problem is circularity. For what is required, in order that the definition of 'statement A is true in selected framework M' should provide us with a definition of truth, of 'A (of L) is true', is that the framework M selected is a correct one, one whose base world T is the factual world, and represents the class of true statements. Thus in order to define truth we have already, in effect, to be supplied with the class of truths, T. An irremediable circularity thus appears to have crept into the business of giving a semantical definition of truth. To avoid this problem resort is made to independent criteria for selecting M. But none of the recipes proposed is unproblematic. Consider the optimisation recipes. Sadly it is all too evident that the model in which we live, so to speak, is far from optimal and certainly far from what many would prefer, or choose, if given the option: and hence it is evident that when selection of the model is made in such ways incorrect assignments can result, truths coming out as false (e.g. because not preferred), and falsehoods coming out as true (e.g. because preferred). Nor is it enough that apparatus which determines the model be given; for all the notions of the theory of reference, the model has to be given correctly. If it is simply given it may be given for reasons apparently quite other than truth, e.g. because of simplicity or for mere usefulness[1] - in which case the method would provide a way of reinstating a pragmatic "theory of truth".

In this way it becomes evident that each theory of truth can furnish its own criteria for determining $\underline{\underline{M}}$. Thus according to the correspondence theory $\underline{\underline{M}}$ is simply the factual model with the interpretation function I giving the correspondence relation; according to the coherence theory M is that model which coheres with experience; and so on. Traditional issues as to truth appear again in the issue of the determination of $\underline{\underline{M}}$ (or $\underline{\underline{T}}$ and I).

Despite this reappearance of philosophical issues at the base of the semantical account, it has seemed to many that the Tarski-Carnap requirement of a translation of the object language (for which truth is defined) into the metalanguage, enables an escape from these difficulties, and so from a charge of circularity. But the translation requirement does not escape the issues but only serves to obscure what is going on. For suppose the translation is incorrect (e.g. because based on a defective account of truth, or of what is true) or even dishonest. This is tantamount to determining $\underline{\underline{M}}$ incorrectly (or dishonestly), since in the same way incorrect assignments will result. The Tarski-Carnap method may well go wrong, that is to say, except with uninterpreted object languages where there is no cross-check on correctness, but where, correspondingly, the question of truth really does not enter. Suppose however we are dealing with an already interpreted or understood language, say with a (semantically open) fragment of English which includes statements such as 'Pharlap is a horse', and let us choose our translation I (rules of designation in Carnap's sense as follows: I(Pharlap) = Porky the pig, and I(is a horse) = λ x horse(x). Then by the rule of truth for atomic sentences (cf. MN, p.5)

$$I\,(\text{Pharlap is a horse}) = 1 \text{ iff } (\lambda x\, \text{horse}(x))\,(\text{Porky the pig}); \quad \text{i.e. iff horse (Porky the pig)};$$

that is 'Pharlap is a horse' is true (in the fragment of English) iff Porky the pig is a horse. It is evident that the translation is incorrect since it leads to falsehood, as 'Pharlap is a horse' is true whereas the pig is a horse' is not true; and it is also evident that the source of incorrectness is the use of an already understood object language which has a different intended interpretation I, i.e. for which I(Pharlap) = Pharlap (the horse). For an uninterpreted object language for which the translation given just did supply the intended interpretation there would be no such possibility of incorrectness. Yet, perhaps surprisingly, the use of incorrect translations leads to no violation of Tarski's convention T (56, p.187-88); for ''Pharlap is a horse' is a name of the English sentence 'Pharlap is a horse' and 'Porky the pig is a horse' is the translation of ''Pharlap is a horse'' into the metalanguage (and 'is true' is tantamount to 'Tr' by the class abstraction principle). It follows that, contrary to widespread claims and to Tarski's large assumption incorporated in the very formulation of convention T, satisfaction of convention T is not sufficient for an adequate definition of truth. This inadequacy will become more conspicuous once we have seen that the translation requirement is equivalent to choice of a basic model; for then it turns out that any choice of a model, not just the choice of a real model $\underline{\underline{M}}$, will bring out convention T. Convention T, like the unqualified translation requirement, is no help in determining $\underline{\underline{M}}$, unless the translation involved is correct - as an identity translation, with I(A) = A, which includes the object language in the metalanguage, will generally be.

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[1] For similar reasons Quine's central thesis, that a pragmatically selected canonical language limns the most general traits of reality, is fundamentally mistaken.

In the case of extensional languages, the specification of a translation in the intended sense (that of rules of designation) is equivalent, as Kemeny points out (56, p.14 ff.), to the specification of a basic model. It is simplest to illustrate the equivalence argument in the case of an applied quantificational logic Q, but the argument extends straightforwardly to Church's simple type-theoretic language (as Kemeny explains). Suppose, firstly, a model for Q is given: it will consist of a domain D of individuals and an interpretation function I defined on initial expressions of Q, say subject terms and predicates, and taking subject terms to particulars of D and predicates to relations on elements of D. Define a new function I' as follows: where t is a subject term $I'(t) = I(t)$, and where f is a predicate $I'(f)$ = instantiates $I(f)$. Then I' provides a translation, almost exactly as in Carnap (MN, p.4): indeed it is valuable to take Carnap's main example in MN as a working illustration. Suppose, conversely, that a translation tr is provided, i.e. a function taking initial expressions of Q into appropriate metalanguage expressions, say subject terms into subject terms and predicates into relations. Define an interpretation I thus: $I(t) = tr(t)$ for subject term t, and $I(f) = \lambda x\,(tr(f))(x)$. Then $<D, I>$ where $D = \{t : tr(t)\}$ provides an interpretation of Q matching tr.

Since translations are tantamount to basic models, the problem of selection of a real model automatically transfers to a problem of selection of a translation - to the determination of a correct translation. In the case we are concerned with, that of intensional languages, the interrelation is more complex, basic models corresponding to translations at each world of the model (or alternatively to translations not just of initial expressions, but of complex expressions as well - but then recursiveness is sacrificed).

That the received, translation, method - which really assumes a selection - does not properly consider correctness can be seen from another angle, from the fact that on the received account a thesis of a system L, any system, cannot be false. But of course the theses of a theory or language, or even a logic, can be false. Some principles of classical logic are false (see RLR). Thus a satisfactory recipe for the determination of $\underline{\underline{M}}$ will have to allow for the possibility that $\underline{\underline{M}}$ is only a framework, not a model. In case framework $\underline{\underline{M}}$ for system L is a model, L will be said to be *in order* (in effect, it has a *normal* truth definition in Wang's sense in 52).

In order to see how the actual Tarski-Carnap-Kemeny procedure - as distinct from the general theory they elaborate - *can* provide a reliable guide for determining framework $\underline{\underline{M}}$, even in the case of intensional languages, consider how truth *is* assessed where an interpreted language or system is involved. Suppose, for example, that the object language is Portuguese and the metalanguage, or universal language, is English. There are two requirements to be met, not just one; namely (i) correctness of translation, and (ii) material adequacy in the sense of convention T. There is a more important special case where requirement (i) is automatically met, that where the object language - no matter how comprehensive - is included in the metalanguage or, better, in the universal language (Curry's replacement, in 63, for the metalanguage). While this inclusion offers a reliable insurance against incorrect translation (by using an identity translation), it does not ensure that convention T will be satisfied; for many frameworks T will fail. This suggests, what is legitimate, defining the real, or factual framework $\underline{\underline{M}}$ as an arbitrarily selected basic model for which convention T holds for every sentence. That is, $\underline{\underline{M}} =_{Df} \xi M(A)(I(A, T) = 1 \text{ iff } A)$. In the case of extensional languages, where the interpretation of every wff can be recursively determined in terms of that of its components and variants just in the base world T, it would suffice to require convention T for every initial wff; but for intensional languages a more comprehensive connection is necessary, as such a single-world recursive procedure is impossible. Almost needless to say, there will be an element of circularity - but not a damaging element - in subsequent semantical definitions which make use of $\underline{M}$. For example, truth is going to be determined in terms of truth in $\underline{M}$, where $\underline{M}$ is picked out as a framework which gets the facts right as stated in the metalanguage. To this rather limited extent the definition writes in a correspondence theory of truth.

The general case where the object language differs from the metalanguage is not so neatly disposed of. But it is clear what in principle would suffice. Were we given a correct translation of the object language into the metalanguage, with tr(A) translating A, then $\underline{M}$ could be determined as an arbitrarily selected framework M such that, for every sentence A, I(A, T) = 1 iff tr(A).[1] The trouble with this resolution of the problem, technically satisfactory though it seems, is that we want the semantics to be applied to tell us when a translation is correct, not to depend on a correct translation or interpretation being fed in at the beginning (cf. Davidson 67 and 73). There are, as might be expected, devious ways around this problem, the following of which will be adopted:- let the universal language contain quotation-mark names of all the sentences of the object language; there is a case for saying that English, as universal language, satisfies this condition. Let the universal language also contain the predicate of sentence names, 'is the case' ('is so', 'is a fact', or the like, e.g. 'is true'). Define $\underline{M}$ as an arbitrary framework M such that, for every sentence A, I(A, T) = 1 iff 'A' is the case. In short, choose tr(A) as: 'A' is the case. Now it will certainly be objected that the circularity is going to be damaging. But really the situation is scarcely worse than with the identity translation.

At this point it is fair to mention some of the things the semantical account of truth, at least as here represented, is not intended to accomplish. It is not intended to provide a full theory of truth: for example, it says nothing directly about how truth is tested, about methods of verification of statements. It leaves open a great many issues concerning truth, e.g. whether there are different sorts of truth not encompassed, whether there are (or can be) different tests of truth, and if so what they are. It does however provide a substantial foundation on which a fuller theory of truth can be built. For it does define truth for an arbitrary object language. But coupling the semantical theory with surrounding theories such as those of evidence, which complete the fuller theory of truth, is further, and unfinished, semantical business.

10. Semantical definitions of core, extensional notions: truth and satisfaction. The problem of determining $\underline{M}$ was the chief problem that lay in the way of characterising extensional notions, given that the obstacle course designed by Black 49, Pap 58 and others for semantical accounts can be got around.[2]

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[1] The translation should, of course, meet certain conditions, e.g. it should be a recursive specification from initial syntactical components, and it should be derivable that, where tr_1 and tr_2 are two translation functions, $tr_1(A_0)$ iff $tr_2(A_0)$. Because of the latter, essential, condition, any correct translation will suffice, in particular a trivial one if it can be found.

[2] (Footnote on next page).

Recall that given a language, or a logic on a language, L a class of models with respect to which L is sound and complete is delivered by a universal semantics. Now define the *factual*, real or absolute L-framework $\underline{\underline{M}}$ among these frameworks thus: M is an arbitrarily selected framework M such that requirement T holds: namely for every wff A of the language, I(A, T) = 1 iff A (or, more generally, iff tr(A)) where I is the interpretation function and T the base world of the model M (and tr(A) is a correct translation of A).

Where A is a closed wff of L, i.e. contains no free variable, A is true (as formulated in L) iff I(A, $\underline{\underline{T}}$) = 1. To gain comparison with the usually defined notion, 'as formulated in L' is often abbreviated to 'in L' and is sometimes omitted altogether. There are familiar options as to what to say concerning wff containing free variables, e.g. that the question of truth does not arise, that they are true iff their universal closures are, and so forth. Another option is to let the metalanguage decide the matter, and to simply drop the restriction, in the definition given, to closed wff. One simple way of taking up the universal closure option is to define A is *true* (in L) as follows: I(A, T) = 1 for every factual framework $\underline{\underline{M}}$, where *a* framework is factual iff it meets requirement T.[1]

Nothing in these definitions excludes intensional generalisation of the orthodox Kemeny-Tarski definition according to which a logic guarantees the truth of its own theses. Consider an uninterpreted logic or, where the logic L is interpreted, consider a reinterpretation. An *admissible* translation, atr, for model M for L is a translation function, defined at least from sentences of L into sentences of the universal language, such that, for every sentence A of L, I(A, T) = 1 iff art(A). Assume, as for instance in Kemeny, that L has an admissible translation for some model. In fact, in view of the completeness of L, there will always be an admissible translation. For let M be the canonical model M_c of L used in establishing completeness and let $atr_c(A)$ be $A \in T_c$ where T_c is the base world of M_c: then atr_c is an admissible translation. Now define the *L-guaranteeing factual* model $\underline{\underline{M}}_G$ as an arbitrarily selected model M which has an admissible translation. $\underline{\underline{M}}_G$ is a model of how things in fact are according to L. Then, where A is a sentence of L, A is *true according* to L iff $I_G(A, \underline{\underline{T}}_G) = 1$.

It follows that, for every thesis A of L, A is true according to L. This establishes an interesting, analytic, form of conventionalism: *every theory is correct according to its own lights. But what is true according to L may not be true* - even *in* L. Falsity and non-significance are defined in each case in a parallel fashion. Let the determining model for truth in, or according to, L be $\underline{\underline{M}}_G$. Then A is false ... iff $I_G(A, \underline{\underline{T}}_G) = 0$, and A is non-significant ... $I_G(A, \underline{\underline{T}}_G) = n$.

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[2] (Footnote from previous page.)

Several of these objections, especially those of Pap, have already been met, in part at least, by Kemeny (see 56, pp.1-2).

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[1] Another way, Kemeny's way, is to define A is true in L in terms of A's validity in the factual model structure, i.e. in terms of A's being true on every valuation in the factual model structure, where the factual model structure $\underline{\underline{S}}$ in effect results from $\underline{\underline{M}}$ by deleting I: but use of this definition involves assumptions it is preferable to avoid in a general theory.

If a bivalent universal semantics is adopted semantic versions of the two-valued laws of thought are forthcoming both for truth in L and for truth according to L, e.g. no sentence is both true and false, but every sentence is either true or false. With the trivalent semantics suggested, a somewhat different set of semantic formulations of laws of thought naturally emerges: though no wff is both true and false, or both true and non-significant or both false and non-significant, some sentences are neither true nor false, because non-significant. However every sentence is either true, false or non-significant - a result that would fail if a polyvalent universal semantics which allowed for other values such as incompleteness were chosen. In any case, whether the semantics is bivalent or polyvalent, expected versions of the famous convention T emerge at once, namely A is true in L iff tr(A) (iff A, in the special inclusion case), and A is true according to L iff atr(A). Similarly in the trivalent case, A is non-significant in L iff tr(A) is non-significant (assuming of course that the iff is appropriately 3-valued, i.e. it represents a connective like $\approx$ of Slog).

The accounts, whether bivalent or polyvalent, can be recast in terms of satisfaction, with satisfaction as primitive in place of truth or with satisfaction defined. For the second option define a satisfaction relation, for example, as follows:- a valuation v (or interpretation I) *satisfies* wff A (or makes A hold) *at* a *in* model structure S iff A holds at a on v in S (i.e. in S I(A, a) = 1), and v *satisfies* A *in* S iff A is true on v in S. Then A is true in M = <S; v> if v is S satisfies A; and A is true iff I satisifes A (in S). Similarly, in the trivalent working example, A is non-significant iff I does not significantly satisfy A.

11. *Semantical vindication of the designative theory of meaning*. Define a *designative theory* of meaning in the accepted fashion, as one which provides 'by a general formula, some entity or thing as the meaning of a linguistic expression' (Caton 71). Then as a corollary of universal semantics (corollary IX to theorem 2 above):

> Every logic formulable on a free λ-categorial language (and hence every language) has a designative theory of meaning.

For define the *interpretation* of A_α (or what A_α is *about*) *in* model M as $I(A_\alpha)$, and *the interpretation of* A_α as $I(A_\alpha)$. Since every logic or language (of the specified type) has a semantics which defines an interpretation function I for each model and since a factual model can be distinguished, a designative meaning, in the sense of interpretation, is provided by a general recipe for each linguistic expression of the logic or language. Moreover, to complete the argument for the corollary, meaning so supplied is always an object - on the semantics invoked a function, and so, in a precise sense, a rule for the application of A_α in every situation and context. In particular, the rule giving the designative meaning of a declarative sentence A_0 holds at a or not (or not significantly). Thus the designative theory affords a basis for the synthesis of various apparently diverse and conflicting theories of meaning, for example designation theories and use theories. It also furnishes all that has been said to be required of a theory of meaning (cf. again Cresswell 76, Davidson 67, p.7). It does not, however, furnish all that ought to be required from a theory of meaning. For example - except in fortuitious circumstances where the language studied does not include quotational devices or functors with quotational features but nonetheless is rich enough to distinguish logically equivalent expressions with distinct senses - $I(A_\alpha)$ does not provide the sense of A_α, $s(A_\alpha)$, in the expected sense, in which A_α is synonymous with B_α iff $s(A_\alpha) = s(B_\alpha)$. The designation theory has, in short, to be supplemented at least by accounts of synonymy and sense - not to mention such matters as metaphor - before a full theory of meaning emerges.

Interpretation, or "designative meaning", is, in the case of rich languages, a highly intensional notion: the corresponding extensional notion is designation (in the wide, non-intuitive, sense discussed in Slog). The designation of A_α is defined as $I(A_\alpha, \underline{\underline{T}})$, i.e. $I(A_\alpha)(\underline{\underline{T}})$. Hence the designation of a subject term, e.g. of D_1 is an object (in Meinong's sense) and the designation of a declarative sentence, e.g. of C_0, is a truth-value. Thus - apart from the Meinongian slant incorporated through the presupposed neutral metalanguage, and apart from the more complex substitutivity conditions, demanded by highly intensional languages - the account of designation is Fregean. However designation is now but a special case of interpretation, and so also, it will turn out, is sense; that is, both sense and designation are unified through the underlying, familiar notion of interpretation: both designation and sense are restrictions of the interpretation function.

Meaning, whether as interpretation or sense or content, is being explicated then as a function. So much is a commonplace of modern semantics,[1] only the details of the accounts given differ, importantly, e.g. as to the range of languages considered, the types of worlds admitted, and so on. There is another difference however that needs to be entered: the semantics presupposed are not simply set-theoretic, and in particular neither functions nor properties are construed in terms of sets. It is true that the underlying universal semantics can be read set-theoretically and that there are some technical results to be drawn from the possibility of such a construal: but the set-theoretic rendition is not the intended one. Accordingly the universal semantics, properly rendered, can agree with the obvious fact that meanings are not sets, and do not have the right categorial properties to (significantly) be sets, e.g. meanings cannot have members, there cannot significantly be a power set of a meaning, and so forth. Meanings and senses are functions, but not sets, because functions are not all sets, though, of course, each function has an extensional, set-theoretic, representation by way of a set of ordered pairs.

Much of the semantical work of Montague 74 and his successors is rendered philosophically naive through extensional identifications, through set-theoretical reductions,[2] and the treatment of merely isomorphic structures as if they were identical. Nowhere is this more evident than in the treatment of intensional notions, where meanings, senses, propositions, contents, properties, one and all, are supposed to reappear as sets. The naivety is avoided by adoption of - what is no embarassment, and involves no great difficulties since a fragment of English, for instance, will suffice - an intensional metalanguage.

Before venturing semantical definitions of sense and synonymy, there are immediate notions in the second tier to consider; and these are, incidentally, instructive both because they help show what sort of definitions are unsatisfactory, and because they provide a simpler setting in which to tackle some of the problems that have lain in the way of more satisfactory accounts.

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[1] The functional account of intensionality seems to have been glimpsed by Carnap (see MN, where special cases are sketched). The quite general thesis that intensions are functions from worlds to corresponding extensions was apparently proposed by Schock.

[2] For a standard, inadequate, reply to this sort of objection see Cresswell (73, Postscript, pp.46-7). The reply fails to meet the objections because there are any number of people who though they know that propositions, for example, are not sets, are not clear what they are.

12. Kemeny's interpretations, and semantical definitions for crucial modal notions. The classical metatheoretical accounts of modal notions, such as necessity, and possibility, run into a severe obstacle in the form of incompleteness theorems and the possibility of non-standard models. In particular, the exact class of necessary truths of arithmetic cannot be captured classically by any recursive axiomatisation. Hence an account of logical necessity, intended to include arithmetic, in terms of truth in all models would be inadequate because some necessary truths would be deleted by unintended non-standard models. For incompletely axiomatised theories there are, classically, too many models, so a subclass of models, which Kemeny calls interpretations has somehow to be distinguished. Much of Kemeny's 56 is devoted to marking out interpretations among models, and indeed his new approach consists primarily of a method for distinguishing interpretations (see p.19). This is at variance with the assumed approach in the case of truth where whatever is true according to the theory is true: why shouldn't whatever is necessary according to the axiomatisation be necessary? But while incorrect axiomatisation of an understood theory is not allowed, incomplete axiomatisation is: 'we are forced to allow for models that were not intended as models' (p.18). For uninterpreted systems there is however no such incompleteness. The underlying vacillation between uninterpreted and already interpreted systems, written into much modern thinking on logical and semantical systems, including Kemeny's, in fact leads to a serious flaw in Kemeny's 'satisfactory semantic theory' (p.19).

Kemeny's new approach is as follows:- it is assumed that such object system L is semantically determinate, that is to say that

> in addition to the formal presentation of L we are given (1) one model, M^*, which has been designated for the purpose of translating from L of ML and (2) an indication of which constants are extra-logical (Definition 13, p.19).

Then interpretations are defined as those models that differ from M^* only in the assignment to extra-logical constants. Finally, modal notions - and also many non-modal notions, e.g. implication and synonymy - are defined in terms of interpretations. Now according to Kemeny, the author of a system is obliged to select M^*, i.e. the factual model $\underline{\underline{M}}$ (see pp.2, 13, 14); he is the person who "gives" M^*. Suppose however, to reveal the flaw, the author perversely, or ignorantly, or for other reasons, selects a non-standard model, that we are given a non-standard model M. Then all the interpretations will likewise be non-standard, since they agree with M in assignments to logical constants. As a result the accounts of modal notions err seriously, e.g. the account of necessity in terms of validity in all interpretations can establish as necessary non-standard, and in the ordinary sense "unintended", statements. The upshot is that, as in the case of truth for already (even partly) interpreted systems, the designer of a system is not free to choose the interpretation. He has to choose both M and the logical constants correctly: and we are not just given M and a listing of logical constants, we have to be given the right packages.

As with truth there are two cases, that for uninterpreted or reinterpreted systems, and that for languages that are already (partly) interpreted or have intended interpretations. Kemeny's account falls unsatisfactorily between the cases. Consider first the uninterpreted case, or reinterpretation case, *where the system sets its modelling*. Then there are no unintended models, there is no call for a subclass of interpretations. Necessity just is truth in all models. More precisely, extending the according to jargon. A is *necessary according to* L iff A is true in all L models, and A is *possible according to* L iff A is true in some L model. Necessity according to L just is validity (or universality, in the sense of Kemeny), and possibility according to L just is satisfiability. By the universal semantics exactly the theorems of L are necessary according to L (contrast p.23 ff.). So any theory can determine what is necessary according to it - another apparent fillip for conventionalism.

The account of necessity according to L conforms to the principle of agreement between the two tiers, enunciated when the two-tier theory was being sketched. The informal connections are as follows: - For every model M,

$$
\begin{aligned}
I_M(A, T_M) = 1 \quad & \text{iff} \quad A \text{ is necessary} \\
& \text{iff} \quad \Box A \text{ is true} \\
& \text{iff} \quad I_G(\Box A, T_G) = 1 \\
& \text{iff} \quad , \text{ for every world } x \text{ in } O_G,\ I_G(A, x) = 1.
\end{aligned}
$$

In short, the accounts coincide upon equating regular worlds with models; and the equation appears in order since each subclass is distinguished as that where all theorems hold.

Kemeny would like to adopt an account of necessity (or Atrueness) in terms of universality, but shrinks from it because of incompleteness. He tries to

> assure that interpretations are distinguished from models only insofar as is necessitated by logical incompleteness. If we could make our systems complete, at least in principle, we could identify Atrueness with validity in all models (p.23).

But (as argued in DLSM), even in the case of richer theories such as arithmetic, incompleteness theorems do not rule out non-classical formalisations, which are in principle at least complete. Admittedly the resulting systems will be negation inconsistent, when thesis completeness is achieved by semantically closing the language, but they need not be trivial, i.e. they may be consistent in Kemeny's sense. It is doubtful, then, that Kemeny's reasons for distinguishing interpretations from models hold up once non-classical formalisations are properly considered.

The situation with respect to an interpreted system is different. What is necessary according to a system may well differ from what *is* necessary. Neither correctness nor completeness of a system with respect to its intended models can be assumed. In particular, if M is not a model, only a framework, the assessment of necessity cannot be restricted to models or a subclass thereof. Such a restriction may not be warranted even when L is in order, since the theses of L, though L true, may not be necessarily true. To characterise necessity in this case let us adopt, for want of a better initial strategy, Kemeny's modernisation of the old recipe: true in virtue of its logical form, or, more specifically, true whatever assignments are made to the non-logical constants. The stragegy has the serious disadvantage of requiring an advance, and correct, classification of constants into logical and extralogical divisions - a classification, already enjoying some notoreity, which encounters new difficulties when highly intensional languages are modelled, and which the semantical theory so far developed has managed to avoid. An $\mathbf{M}$ *logical variant* is a framework that differs from $\mathbf{M}$ only in the assignments to extralogical constants. A is *necessary* (*with respect to* L) iff A is true in all M logical variants. Hence what is necessary wrt L is true in L, but some theses of L may not be necessary wrt L. What is necessary according to L is not what is necessary wrt L if L is either unsound or incomplete.

Lurking behind the account of necessity wrt L, and likewise that of truth in L, is the ideal of an absolute language-invariant notion of necessity, and likewise of truth. Necessity wrt L is supposed to be assessed in terms of what is necessary - period. Similarly for truth. Once the levels theory is got rid of - a worthy but not immediate objective - there is no bar to language-independent definitions of semantic notions, but it still needs to be shown that the defined terms have appropriate invariance properties, e.g. invariance under translation (cf. 56, §8). Moving outside the orthodoxy of the levels theory does however suggest strategies for improved, less language dependent, definitions of semantical notions, in particular definitions which do away with such devices as the division of constants - definitions which can then be fitted back within the narrow confines of the levels theory. One strategy applies the principle of agreement. Given, what ought to be admissible, iteration of semantical functors, *the problems of invariant characterisation all reduce to the problem*, already tackled, *of characterisation of truth*. Consider, for example, necessity, A is necessary iff A is necessarily true, i.e. iff $\Box A$ is true. But $I(\Box A, \underline{\underline{T}}) = 1$ iff for every regular world x, i.e. every x in $\underline{\underline{Q}}$, $I(A, x) = 1$. Now apply the principle of agreement. Select a class of *regular* frameworks, one M(x) for each world x in $\underline{\underline{Q}}$, as follows:- M(x) is an arbitrarily selected framework such that, for every wff B,

$$I_{M(x)}(B, T_{M(x)}) = I(B, x).$$

Then, by the informal arguments, A is *necessary* iff for every regular framework M in the class, $I_M(A, T_M) = 1$. Given $\underline{\underline{M}}$ the regular frameworks of the class can be defined; and then *necessity* in L can be defined, as above, shortcircuiting the informal verification circuit. A similar strategy can be exploited in the case of other semantical notions. That is, the appropriate second tier can be distinguished, by way of truth, using the corresponding first tier. This is the strategy that will be adopted, not just for necessity, but for such notions as entailment.

13. *Normal frameworks, and semantical definitions for first-degree entailmental notions*. Entailment cannot be adequately defined, even at the first degree in terms of modal notions (see ABE, especially §29.12). The same holds for logical consequence, coentailment and propositional identity. Thus the semantical definitions for these notions proposed by Tarski and others, which are all couched in essentially modal terms, are bound to be defective. To define entailmental notions semantically, models or interpretations are not enough; it is essential to look at frameworks which are not models, where theorems fail - else such paradoxes as that every sentence entails every theorem are unavoidable on the expected inclusion definition of entailment. Given the appropriate class of frameworks, *normal* frameworks, the inclusion definition is simply: A *entails* B (vis à vis L) iff for every normal framework M, if $I_M(A, T_M) = 1$ then, materially, $I_M(B, T_M) = 1$. The only problem is to define normal frameworks. But this problem has been solved (to my satisfaction at least) in the systemic case (see RLR). Using the principle of agreement, the solution can be transferred (as in §7) to the metalinguistic case. There are two cases, and they are treated similarly. To define entailment *in* L, define a class of normal frameworks M(z), one for each world z in $\underline{\underline{K}}$, as follows:-

$$M(z) =_{Df} \xi M(B)(I_M(B, T_M) = I(B, z)).$$

To define entailment according to L, define a different class of L-normal frameworks, using I_G in place of I.

The pattern of definition is the same for coentailment and for what coincides at the first, but not at higher degrees, with coentailment, namely, minimal propositional identity (so at least it is argued elsewhere: see Routley[2] 75). That is, A is (minimally) propositionally identical with B (vis à vis L) iff for every normal framework M, $I_M(A, T_M) = I_M(B, T_M)$. (This definition, unlike the entailment definition, suffices for polyvalent cases.) The most plausible objection to this definition is that a class of normal frameworks is not liberal enough, and that additional frameworks are needed to discriminate distinct propositions which use of normal frameworks only would conflate. Technically it is not difficult to expand the class of normal frameworks to various other more comprehensive classes of frameworks, some of them naturally motivated; and philosophically there is, certainly, some basis for the expansion. Where there is a genuine, and conspicuous, basis for the expansion is with such notions as synonymy.

14. Wider frameworks, and semantical definitions for synonymy notions. Carnap, Kemeny, Montague and other semanticists have attempted to treat synonymy, like entailment, as a modal notion. For example, Kemeny defines phrases as synonymous if they have the same value in every interpretation (56, p.22): according to Kemeny, 'this is the weakest acceptable criterion of synonymy'. But really it is quite unacceptable, since it makes all necessary sentences synonymous, all logically impossible sentences synonymous, and so on. And even hardened semanticists have realised that such an account is unacceptable and have cast around for alternatives, but what they have come up with is, for the most part, also unacceptable (intensional isomorphism, as in MN, is perhaps the classic example).

A superior lower bound on synonymy is provided by normal frameworks; and an upper bound is given by the class of all frameworks. But the upper bound is evidently too generous in the case of languages, such as natural ones, which contain unsegregated quotation devices or functions, especially when the objective is to define literal sense. For example, the synonymy claim, Brother $\underset{\sim}{s}$ male sibling, is often adopted as a paradigm, yet the assertion 'The vicar preached an interesting sermon on brothers' does not mean the same as, and does not appear to entail, the assertion 'The vicar preached an interesting sermon on male siblings'; and the situation is worse with sentences like 'The debate was about brother earth', where non-literal meanings and associations enter. But meaning in the full sense which includes the non-literal aspects is already accounted for by the interpretation function I. The problem is to characterise sense in the literal sense in which 'brother' is synonymous with 'male sibling'.

In the quest for an account of literal meaning there are optional paths (which tend however to converge) along which to proceed here. One option - the less satisfactory by a good margin - is to start with synonymies written in by the evaluation rules to all frameworks, and to purge the language of quasi-quotational functors, which are to be analysed in terms of explicit quotation later on. This deprives us of direct semantical analyses of quotation and of the rich variety of functors that involve it, and also of direct analyses of the non-literal components of meaning. The preferred option is to have initial synonymies imposed by semantical rules for a proper subclass of frameworks called wider frameworks. All the specialised frameworks previously introduced are subclasses of wider frameworks. Then, for every structure label α, A_α is synonymous with B_α (vis à vis L) iff for every wider framework M,

$I_M(A_\alpha)(T_M) = I_M(B_\alpha)(T_M)$.

The problem is to determine where, between normal frameworks and all frameworks, wider frameworks lie. For, unlike the case of entailment, there is so far no ready-made systemic account of synonymy to fall back upon. Nevertheless the problem is rendered more tractable by shifting it back to the systemic stage. Then what is needed, for each framework, is a class U of *literal* (and non-quotational) worlds, with $K \subset U \subset W$. For initial synonymies, supplied by a dictionary for the language, identical valuations will be supplied for each situation a in U; e.g. if according to the dictionary A_α has the same sense as B_α, i.e. $A_\alpha \underset{\sim}{s} B_\alpha$ is an initial synonymy, then for $a \in U$, $I(A_\alpha)(a) = I(B_\alpha)(a)$. That is, initial synonymies are transformed into semantical constraints on situations in U. The fact that some initial data has to be supplied - syntactically, in the form of dictionary, by way of "meaning postulates" and so on - is no serious limit on semantical analyses: such contingent data as that symbolised in 'brother $\underset{\sim}{s}$ male sibling', has, scarcely necessary to say, to be supplied from without. In addition, it is supposed that functors come in two kinds, those whose semantical assessment at situations in U requires no appeal to situations beyond U, and those whose assessment goes beyond U, quotational functors. Again, the rules for semantic evaluation have to be written in: like the rules for assessing the entailment functor they are determined using (partly) external conditions of adequacy. Providing separate semantical rules for each sort of function in the language is a perhaps tiresome, but inevitable, part of the semantical procedure. With this information, semantical development can forge ahead. The desired underlying metalinguistic distinctions are then recovered from the systemic distinctions by way of the principle of tier agreement. In particular, the *sense* of A_α, $s(A_\alpha)$, is the restriction of function $I_M(A_\alpha)$ to literal worlds: hence when $A_\alpha \underset{\sim}{s} B_\alpha$ then $s(A_\alpha) = s(B)$, and conversely.

The syntactical upshot is transparent: quite generally for any parts of speech, if $A_\alpha \underset{\sim}{s} B_\alpha$ iff for every non-quotational functor $\Phi_{o\alpha}$, $\Phi_{o\alpha}A_\alpha$ iff $\Phi_{o\alpha}B_\alpha$. Most of the many logical properties of synonymy flow from this connection. In particular, synonymy is an identity, an equivalence relation preserving intersubstitutivity in an important class of sentence contexts, non-quotational ones. There are two respects, however, in which this account falls short, as regards contextual variation and concerning interlinguistic synonymy. The semantical theory, unlike its syntactical consequences, can be straightforwardly enlarged to take account of these important issues.

Each model M can be seen as comprising a single interpretation function I and a model structure S, i.e. $M = \langle S; I\rangle$; for interlinguistic synonymy the interpretation function is replaced by two interpretation functors, one for each of the languages concerned. An *enlarged* framework for logics on languages (or languages) L_1 and L_2 is a structure EM of the form $\langle S; I^{L1}, I^{L2}\rangle$, where I^{L1} is an interpretation for L_1 and I^{L2} for L_2. Observe that the model structure is invariant; so the class U of literal worlds, in particular, does not require re-specification. Then phrase A_α of L_1 *is synonymous with* B_α of L_2 (*vis à vis* L_1 *and* L_2), $A_\alpha L_1 \underset{\sim}{s} B_\alpha L_2$ for short, iff for every wider enlarged framework $EM = \langle S; I^{L1}, I^{L2}\rangle$, $I^{L1}(A_\alpha)(T_{L1}) = I^{L2}(B_\alpha)(T_{L2})$. The extended systemic connection from which the determination of wider enlarged models derives is: $A_\alpha L_1 \underset{\sim}{s} B_\alpha L_2$ iff, for every a in U, $I^{L1}(A_\alpha)(a) = I^{L2}(B_\alpha)(a)$. Naturally, for the semantical analysis to work, initial interlinguistic synonymies have, in effect, to be written in at the bottom: no abstract semantics is going to supply, free, an empirically-determined dictionary which translates initial phrases of one language into those of another. Even semantical magic has its limits. The definition proposed also applies only where the phrase structures of the languages correspond - something that will presumably always happen at least in some cases, e.g. that of sentences. But languages with radically different syntactic structures, e.g. with different initial structure labels, raise difficulties for the initial specification of enlarged models. Indeed several features of enlarged models have deliberately been left indeterminate, to be taken up more precisely as the semantic art improves. Some smaller margin of indeterminacy in how details are taken up should, in any case, remain as residue, reflecting the fact that the notion of synonymy to be explicated - though clearly different from what most semanticists have supposed it to be - is not sharply delineated one; it is, like sense, a determinable.

The general pragmatico-semantical theory so far developed has another weakness, compensating for which will also be left largely for the future, namely the limited extent to which the theory actually takes account of aspects of context - even if the main technical apparatus is already encompassed in the theory, and each interpretation function I strictly depends on a context parameter among others. The issue of context is important for any theory of meaning and synonymy. For, in one sense 'I am hot' said by x means something different from 'I am hot' as said by y; but in another sense they mean the same. This can be expressed, in a way that has a substantial basis in English, by saying that the sentences have the same *sense* but different *content*. Thus sense is a semantic notion not changed by charging (non-metaphorical) contexts, whereas content is a fully pragmatic notion for which context can make a real difference. This notion of content, *literal* content, should be distinguished from another notion of content, *informational* content or information, which is an entailmental notion defined in terms of normal frameworks (the logic and semantics of information are studied in UL). Informationally ~~A has the same content as A, but literally they differ. Correspondingly there are two determinate notions of proposition and so of propositional identity, the first degree entailmental notions already introduced which provide the lower bound on the determinables, and notions which amount to literal content and literal content identity that furnish an upper bound on the determinable notions, proposition and propositional identity. The logical determinable/determinate distinction here invoked is explained in more detail in Slog; the leading idea, which has some analogy with that of systematic ambiguity, is however that the one unambiguous determinable notion such as that of proposition or of universality can have several different determinates falling under it (see further §20). The parameter that varies in the case of *proposition* is the variable k in the semantical quantifier: for every k-type *framework*.

Literal content depends both on sense and on context. For where context c_1 differs from context c_2, $A_0(c_1)$ has a different content from $A_0(c_2)$. To formalise the theory of literal content it is adventageous to introduce content indicators into the syntax (as in Slog), something that can be done definitionally here. Then A_α in context c_1 *has the same content as* B_α in context c_2, $A_\alpha(c_1) = B_\alpha(c_2)$ for short, iff $A_\alpha \underset{\sim}{\underline{s}} B_\alpha$ and $c_1 = c_2$. Strong identity of content is by no means the only content identity notion of ordinary philosophical interest: contingent identity of content, which also yields a determinant of *statement*, is at least as important. For example 'I am hot' as said by x, though not identical in the strong way with 'x is hot' as said by x in an otherwise similar context, is contingently identical with the latter.

15. *Solutions to puzzles concerning propositions, truth and belief*. A proposition is an *object*, an object of thought, belief, assertion and other propositional attitudes. The standard case for the introduction of talk of

propositions takes the following lines:- When two or more creatures believe, think, or assert the same thing, they are all related to one and the same object, the proposition in question. The explanation of sameness, which is otherwise problematic, lies in the oneness of the object, the proposition. Propositions are extramental. For, firstly, since different creatures can relate to one and the same proposition it cannot be in, or confined to, the mind of either. Secondly, some propositions have never been thought of by, or otherwise propositionally related to, any creature. Nor are propositions physical- or empirical-world objects. For even if some true propositions can be equated, with some semblence of plausibility with states-of-affairs in the real world, false propositions cannot. These sorts of considerations, which show that propositions are not mental or physical or empirical-world objects, have commonly been taken - mistakenly - to show one of two things: either, under the influence of platonism, that propositions are the designs of some third realm of entities (thus, e.g., Frege, Popper) or, under the influence of nominalism, that propositions are not objects at all (thus, e.g., Armstrong 73, pp.43-4). They would only show the latter if physical and mental objects were exhaustive of objects, which they are rather clearly not. Abstract objects such as attributes are among such omitted objects; and so too are propositions, since they also may be characterised by abstraction.

The theory of propositions to be advanced is an elaboration of that already detailed in Slog, p.441 ff, according to which the proposition that A, §A for short, is given by a class of context-situations where A holds; i.e. $§A = \Theta\{a \in K_d : I(A, a) = 1\}$ where Θ is a one-one giving function (the inverse of the interpretation function I), and K_d is a determinable class of context-situations which includes at least all those situations required for the semantical evaluation of entailment. The elaboration consists in the thesis that the term 'proposition' is a logical determinable, in the sense explained above in §1.20.) The common covering sense of 'proposition', is that shown in the semantical equation linking I(§A) with a class of context-situations K_d (as in effect displayed above), the determinates falling under the determinable depending on the choice of K_d. Stricter determinates will require a larger class of context-situations, preceding in the limit to the class of all such situations; laxer ones a less comprehensive class, bounded below by the class of situations involved in the assessment of entailment. Thus each determinate sense §A is given by a range of A, different determination corresponding to different ranges between the bounds. The account of proposition given merges precisely with the contractional account of proposition in terms of abstraction from an equivalence class of statements, the semantical determinability feature corresponding exactly with the equivalence relation in terms of which the contraction is made (the details are those of Slog p.447 and §3.6).

On the theory sketched propositions are functions of a certain sort. Thus propositions are objects since functions are. Furthermore they are abstract objects, distinct from sets (since an extensional reduction of functions is being rejected), which do not exist (since no purely abstract objects exist).

The theory of propositions outlined enables simple solutions to be given to several problems; in particular, how are propositional attitudes such as belief to be explained. The obvious account, which most philosophers find "natural" but go on to reject, is that belief is a relation between a believer and an object, namely what is believed, i.e. the proposition concerned. That is, 'x believes that p' is, as it appears, of the relational form 'xRy', specifically 'xB§p', with §p the object of belief. According to

Russell (12, p.193), 'the necessity of allowing for falsehood makes it impossible to regard belief' thus. The reason given is that where the proposition is false no such object exists. But existence is not required (nor is it given even where the proposition is true); for belief is an intensional relation, and an existing creature can believe what does not exist, as it can desire what does not exist. Armstrong, following Russell, makes a similar mistake, and claims that 'Meinong and others provided false propositions in the world to be the objects of such things as false beliefs' (73, p.44). This is quite inaccurate. Meinong analysed propositions in terms of objectives, and false propositions in terms of objectives which did *not* obtain, and which certainly did not exist. Such objectives were not part of the empirical world. Similarly in the theory given, propositions (though not the same as objectives) do not exist and are not in the physical world. But because propositional attitudes are *intensional* relations, between the holder of the attitude and the proposition at which it is directed, truth of the relation does not require existence of the propositions.

Secondly, it is not difficult to supply a theory of truth meeting Russell's

> three requisites ... which (1) allows truth to have a opposite, namely falsehood, (2) makes truth a property of beliefs, but (3) makes it wholly dependent upon the relation of the beliefs to outside things (12, p.193).

A belief that p is true iff the proposition that p is true, i.e. iff it is true that p, i.e. iff p. The first connection uses the linkage established between what is believed and propositions, and the latter connections are biconditionals derived from the semantical theory of truth. Then, truth is a property of beliefs (for, the belief that p is true iff the belief that p has the property of truth, by the general connection: xf iff $x \iota \lambda f$); truth has its traditional opposite falsehood (for a belief that p is false iff, by similar connections, it is not the case that p); and the truth of the belief that p is entirely dependent upon that of p, 'the truth of the belief is something not involving beliefs, or (in general) any mind at all, but only the *objects* of the belief' (12, p.202).

Thirdly, Armstrong's 'difficulty for all theories' of propositions, that of giving 'an account of what it would be like for the proposition "Nothing exists" to be true' (73, p.49), is no difficulty at all for the theory. For the truth of the proposition "Nothing exists" does not imply that an abstract object, namely that proposition, exists, contradicting the claim that nothing exists: true propositions do not exist any more than false ones or other abstractions. The difficulty is an analogue of the traditional "riddle" of non-existence, and, like it, causes no problems for noneism. But surely the difficulty reappears in explaining the supposed truth of the proposition "Nothing is an object"? Not at all; for such a case is impossible: there are no circumstances where the proposition would be true given that propositions are objects.

16. *Logical oversights in the theory: dynamic or evolving languages and logics.* The programmatic semantic theory of meaning, truth and denotation sketched out is evidently short of detail on several important issues, for example, the precise form of the intensional ontologically-neutral metalanguage presupposed, the role of context and how it functions in determining meaning, the constraints on wide frameworks, and the types of

ambiguity that the theory recognises. But there are other facets of a full theory of meaning that have been entirely overlooked, in particular all those features that have to do with language change and the dynamic aspects of meaning and designation.[1]

A language is not a static thing, but changes from day to day and from generation to generation. If formal investigations are to get to grips with living language, the static account of a formal language, bequeathed to us by Hilbert's Göttingen group, needs to be exploded to a dynamic account. Present day formal languages and logics can be seen as static sections, momentary snapshots, of evolving, dynamic languages. This fact suggests an initial plan for characterising dynamic languages, in terms of their static instances. First of all a language has, like a person, a lifetime, from time t_1 to t_2 say. At t_1 it is born or created, at t_2 it dies; in between it may develop, flourish, decline. A dynamic or evolving (free λ-categorial) language is a symbolic system such that each instant of its lifetime is a static (free λ-categorial) language.[2] This describes, though in an excessively liberal way, a language in the (accepted) symbolic sense. There is much more, of course, to a natural language than merely being a symbolic system; such a language may even amount, through associated features, to a form of life in Wittgenstein's sense. But even to capture the symbolic core of a natural language in a formal way would be a sufficient achievement. The trouble with the characterisation suggested is that it allows a structure with a lifetime of three days which is Hindi on the first day, Maori on the second and Swahili on the third, to rank as a dynamic language. Evidently the static components of a language have to be appropriately related; the issue of identity conditions for a language undergoing change has, in short, arisen. The problem is but an interesting special case of the general problem of the identity of things changing over time: almost every feature of a language can change - words certainly, parts of speech yes, grammar, yes - but none may change too rapidly or with excessive discontinuity. Similar problems of identity over time in principle arise with respect to a logic on a language; its axioms and rules can only change in a controlled way - as subject to conditions C, to use some mock-up formalism. A dynamic logic LD on a language is represented by a sequence of logic LD_i on languages over the language lifetime ($t_1 \leqslant i \leqslant t_2$) subject to set of conditions C on the sequence. Important as it is to determine conditions C (e.g. from reflection on the general features of languages viewed as extended temporal objects), a determination is not needed for a general semantical analysis of LD; for whatever the conditions they can transfer from conditions on a sequence of static languages to conditions on a sequence of static (basic) models. Then a model for LD is represented by a sequence of models for LD_i. A genuine model for LD, i.e. a genuine model sequence, can in turn be distinguished. It is then a straightforward matter to account, in a rudimentary way, for such matters as meaning change.

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[1] There are other features of language bound up with the full theory of meaning that can however be theoretically separated from it, e.g. issues of language learning, semantic competence, etc.

[2] Since the phrase 'dynamic logic' has recently been coopted to distinguish certain static tensed logics, the newer term 'evolving' has a point.

17. Other philosophical corollaries, and the semantical metamorphosis of metaphysics. The main thesis is simply that many philosophically influential reductive positions, when generously construed, furnish semantical analyses whose correctness can be demonstratively established. The treatment of the designation theory of meaning in 11 above affords a classic example: under the wide construal adopted the theory is demonstrably correct; but under a narrower, referential, construal it is false. In short, many wide reductions, taken as semantic analysis, are necessarily true, and thus reconcilable with non-reductionist positions. Where this is so the reductions furnished are not paradoxical, or wrong, but demonstrably correct, and not trivial, though sometimes virtually platitudinous. So results a synthesis of transcendental and reductive positions. (The synthesis is explained and the thesis defended through an array of examples in SMM.) The wide reductions are demonstrable (in such cases) using the universal semantical theory.

What has generally happened, however, is that the reductions adopted are intended to work with a narrower reduction base which fits in with some cherished programme, such as empiricism. Under this contraction of the base, the reductions cease to be demonstrable, and succumb to formal counter-examples and their more familiar intuitive analogues; and it is under these narrow construals that the reductions are paradoxical (in Wisdom's sense). But one important reason why the reductions are so appealing is that they rely on widened, correct, versions of the reductions where further situations are admitted into the analysis. The detailed examples of SMM - of extensional reduction, of verificationism, of cause as constant conjunction, of reality as appearance and appearance through reality, of the mental through behaviour, of value through preference, and of best choice as maximum utility - elucidate and support these substantial claims.

V. *Further evolution of the theory of items.*

A general, and generous, logical framework for the theory of items has been outlined. But the framework so provided has been applied neither in the semantical investigation of parts of speech not already assessed in quantified intensional logics, nor, of more immediate relevance, to illuminate important features of objects, e.g. what sorts there are, what they are like, how they acquire their properties, and so on.

Two comparisons will help reveal what has been omitted. The first concerns the interwoven (large, ambitious, and rather exhausting) project of furnishing a logico-semantical theory for natural languages, and a semantics for English in particular. Here a logico-semantical framework has been presented, but few are the details so far given as to how it is to be applied, how the impressive variety of English parts of speech are to be semantically encompassed within the framework. Some of the desired details are readily derived, some require supplementation of the framework theory. It is evident, to revert to an earlier example, that an adjective A carries different structure labels according as it has an attributive role, in which case it takes common nouns (with label 2) into common nouns and so A has label (22), or as it has an predicative role, in which case it takes inflected parts of state and change verbs, notably of the verb 'to be', into a predicate with label (01) and its label is not uniquely determined but depends on the verb (e.g. if the label of 'is' is always 0(1, 1) then A's label is ((01)(0(1, 1))). If further a common noun signifies at each world a class then the interpretation of an attributive adjective is a function taking the class at each world into another class at the same world, e.g. 'brown' takes the set noun 'n' designates, I(n)(a), into the subset of brown objects of I(n)(a). (Genuinely modifying adjectives always select subsets of the class their interpretation function applies to.) By contrast, the framework gives little guidance as to how such nondeclarative sentences as imperatives and questions are to be encompassed, rather it leaves a range of options open (e.g. all the reductionist options canvassed in Cresswell 73, and the more satisfactory option not there considered of assigning separate structure labels to these distinctive sorts of non-truth-valued sentences).

A glance at the contents of Cresswell's Logics and Languages 73 illustrates the first point nicely. The essential logical and metaphysical details of Cresswell's parts I and II have already been covered in §24, and a more comprehensive neutral framework given. But comparatively little of Cresswell's parts III and IV, on English as a λ-categorial language and as a natural language, have been explicitly treated in a noneist fashion. Most conspicuously, little detailed semantical analysis of parts of speech, has been presented although all the theoretical apparatus required has been supplied, and though in fact some of the analyses now available in the literature can be readily adapted. Indeed much can be accomplished in the elementary, perhaps at first sight trivial, but still informative, way the example of 'brown (22)' illustrated. Since the basic parts of speech have been accounted for (more or less), consider for instance a part of speech A with structure label (αβ): often the interpretation of A can be given as that function I(A)(a) of A at world a which applied to an object of type β at a yields the A (restricted) object of type α at a (i.e. the relation interpreting A reduces to the A-function).

The second comparison is very different and more to the point. Although an abstract map of Meinong's jungle has been sketched, revealing some of the structural geography, not many are the details that have been given of the inhabitants of the jungle. It is time to make amends, beginning with a survey of the inhabitants.

§25. *On the types of objects.* The aim of the comprehensive theory of objects is to include, and ideally to characterise at least in part, every sort of object - not just deductively closed objects (as on a very early version of the theory of items), or else certain deductively open objects, but both.

Though almost all philosophers try to severely restrict the class of objects they are prepared to consider or talk or think about or take account of in their theorising, it is very much in the spirit of the theory of objects to investigate all types, and there is neither need nor good reasons for restrictions on the types. No object then should be beyond the range of the object variables of such a theory: the theory should, in a good sense, be about every thing - (just as this text is intended to be, in principle at least, about everything). Thus, inasmuch as paradoxical objects and radically inconsistent objects are objects,[1] a theory should be about such objects, among others; but it may refuse of course to ascribe a expected features to each objects, and will have to do so unless paraconsistent. The fact that all objects are included in the theory says nothing furthermore as to their roles or their importance: many of them will no doubt be quite unimportant and have no philosophical role, but some are very important and have major mathematical or theoretical roles (see 10).

The classification of objects which follows is relatively poor by comparison with Meinong's rich phenomenological classification of objects. Thus, for example, nothing much is said of immanent objects or auxiliary or ultimate objects or for that matter of sense data - for reasons that should become clear by chapter 12. Some of the classifications of objects that are made have already been adopted, others will be adopted (and the basis of various classifications will be further investigated in later chapters):

1. Modal (and ontic) status. Objects divide exclusively and exhaustively into existent, (merely) possible, and impossible objects. Subsequently when temporal differences are taken account of (in chapter 2) this classification will be elaborated: at that stage existing and sometimes-existent but not existing objects are separated. With the introduction of time and tense many other distinctions emerge, e.g. that between past and present and future objects.

An important division of possible objects is into consistent objects, such as abstractions, which in a good sense could not possibly exist, and possibly existent objects, such as particulars which in other possible worlds do exist.[2] A logically important subclass of impossible objects - which on an alternative and rather tempting classification are isolated as a separate group - consists of paradoxical objects, that is of objects such as the Russell class, the impredicativity property, the Liar statements and so on, that generate logico-semantical paradoxes.

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[1] This is of course a contentious claim. Meinong, for example, was in doubt as to whether paradoxical items are objects: see 5.3.

[2] The distinction corresponds, very approximately, to Meinong's distinction between "real" objects and ideal objects (see, e.g. GA II, p.77).

Cross-classification of objects tying with modal status have also of course been invoked, e.g. the distinction between complete and incomplete objects. One cross-classification of especial importance is that in terms of

2. Abstraction status. Objects divide into particulars and abstractions, i.e. abstract objects or universals. Particulars may be divided, roughly at least, into individuals and complexes. Abstractions, which are ultimately abstracted from particulars by abstraction conditions, divide into a wide variety of objects, e.g. propositions, properties, relations, functions, classes, worlds, states-of-affairs, objectives[1] (see further 3.9).

Some of these distinctions, e.g. that between individuals and complexes (i.e. units composed of individuals such as forests and bands) are disturbingly soft. For example, most individuals, save perhaps the ever-retreating ultimate physical particles, can be viewed as complexes, and conversely complexes can be viewed as individuals. It is for this sort of reason too that no excessive weight should be placed on Meinong's valuable cross-classification of 2,[2] namely

2'. Order status. Objects divide into lower or bottom order objects, individuals or ground floor objects, which are not dependent on further objects, and higher order objects which 'depend upon' lower order objects.

These are by no means the only divisions of objects that have been used or that are profitably made. Another useful but none-too-sharp distinction, for example, is that between theoretical objects, the objects of theories (whether true or false), usually scientific theories, and fictional objects, which (on more modern construals) include the objects of fiction, myth, legend, and so on. (The distinction is further considered and sharpened in chapter 7.) The division is often taken, somewhat erroneously, as one of subject matter; this at least accounts for the apparent fact that the division becomes hazy where the subjects run together, as in more theoretical fiction and around the less reputable periphery of the sciences extending out to the areas of magic, alchemy, myth, and so forth. Fictional objects are primarily, but by no means invariably, particulars, whereas theoretical objects are often, but by no means always, abstractions, as are, e.g., the principal objects of mathematical investigation.

A notable feature of mathematical objects[3]-those of mathematical theories and the subjects of mathematical investigations - and, more generally, of theoretical objects, is that they are deductively closed, or deductive, or d-closed, objects; that is, where a is such an object, if (being) h is a logical consequence of properties a has then ah.[4]

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[1] Reduction attempts which accept classification 1 typically try to reduce the nonexistent particulars of classification 2 to abstract objects. Some of these attempts are assessed in 12.4: they are invariably failures.

[2] Despite the remarks here and early in the book about this distinction, it is applied in a rough and ready way, often enough in the book (see also 12.2).

[3] This is, obviously, another disciplinary division, and as such of no more merit that the separation of disciplines upon which it rests.

[4] Entailment and logical consequence of properties are defined in the expected way, e.g. (being) f entails (being) g iff, for every x, xf entails xg.

By contrast, there is often no basis for assuming that a fictional object is deductively closed (in fact source books for fictional objects generally do not guarantee deductive closure). Such objects which are not d-closed are open, or d-open, objects. Here lies a fundamental division (if one still relative to the underlying theory of deducibility), that in terms of

3. Closure features. Closure can occur under a variety of relations or operations, but perhaps the most important case is that of deducibility. Properly theoretical objects are closed under deducibility. It is a mark of a purely scientific theory that it is closed under deducibility, just as it is a mark of such a theory that it is eventually falsifiable; and deductive closure of objects follows from deductive closure of theories. For if ah and h entails g according to the theory then ah entails ag, whence ag by theory closure. It is a consequence that the theory of items presented in this book is not a purely scientific theory.[1] For not all the objects to which it applies are deductively closed, various objects of fiction for example are not.[2] Worlds again offer some valuable guidance as to the division of objects generally into deductive and nondeductive. For an important class of worlds (beyond K) is not closed under provable entailment; some of worlds of imagination and likewise worlds of fiction are like this (see 7.8 ff.)

4. Descriptive features. Meinong remarks that an object of thought can be treated

> as 'closed', in which case it, not only has no further properties, but is incapable of having any. ... In general, however, we treat objects (at least those) of the form 'something that is so-and-so' as if they were 'open', not 'closed'; that is we leave blanks in their constitution which we fill up as we proceed (Findlay 63, p.157).

But as Findlay further remarks the view of "filling up" as not affecting identity is 'a loose one' which Meinong afterwards rejects.

There are significantly different distinctions here which it is easy to conflate. Firstly, there is often a descriptive openness in a description of an object. Recall the red-headed man of §14 and §22. The ordinary description 'the red-headed man' is open to elaboration, but in ways that are sharply delimited by features of the (already) constituted objects. But if the description is a description of the pure object the red-headed man then it is not open, but descriptively closed. This distinction calls for a comparison between a description and a constituted object, so it does not really provide a classification of objects as of the way they can be described, more or less completely.[1]

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[1] It is a consequence that the reader may view with joy or alarm according to his philosophical disposition and preconceptions. A logical theory is infected by some of the data it endeavours to take account of. Some perfectly respectable theories are not scientific. For example, a purely logical theory, all of whose theses are analytic, is never falsifiable. And such a theory may far surpass actual scientific theories in methodological features that are sometimes made much of - especially in statements as to "the scientific outlook" - such as exactness of statement and postulates, rigor, effectiveness, etc.

[2] Central parts of the theory are however intended to be closed under a good deducibility relation. But parts, e.g. the paraconsistent parts, are not closed, and not intended to be closed, under material or strict consequence: that it is not so closed is no valid criticism of it.

Secondly there are progressively-selected objects, which acquire further features by further selection. Someone thinks of something, then something blue, then something blue which is heavy. Again, to avoid conflict with the logical theory, especially of identity this is best viewed not as a further determination or "filling up" of *an* object but as progressive selection of objects.[2] Again it does not provide a further type of objects.

Thirdly, however, there are evolving objects, which do change their features. To avoid damaging inconsistency this is best regarded as occurring over time. Then the one object does not both have and lack a given extensional feature, but has a feature - at one time but not at another. Thus objects can be distinguished in terms of

5. *Change status*. Objects separate into evolving or *dynamic* objects which change, and fixed or *static* objects which do not. The pure object, the round square, like most abstractions, is a static object. But all entities and most fictional objects are dynamic.

It is as regards evolving objects, not fixed objects, that it is legitimate to speak of the *actualization of possibilia*. Possibilia are sometimes actualized. During the writing of the first version of this chapter, in a country town environment, a hotel was erected on the opposite corner. Even if (as was unlikely) the hotel was built rigorously to specifications, there are so many matters left open in plans (which supply a main component of the source books for buildings) that there are very many possible hotels that the hotel on the opposite corner *could* actualise. Which possible hotel, or hotels, does it actualise? On the one hand it seems that the answer should certainly depend on actual features of the hotel ħ built, for it is this that is the actualised result. On the other hand it seems that it should have something to do with the (varying) intentions of the architects and others who designed it, so long at least as the result did not diverge too far from the plans. But there is no one ready-made answer to the question: the issue is a conflict one calling for decision. One resolution, perhaps the best, is this:- The hotel ħ actualizes all those possible hotels whose features, as provided by their characterisations (i) include the characterising features of the specifications of ħ that are consistent with those of the actual ħ, discounting features in the specifications that ħ does not have, and (ii) are included in the features of the actual hotel ħ. Thus the actual hotel will actualize at least denumerably many possible hotels. It cannot of course actualize any impossible hotels, e.g. hotels with both fifteen and sixteen bedrooms. If hotel ħ has, in accord with its specifications, fifteen bedrooms, seven showers, one lift, is painted red, etc., then ħ actualizes only possible hotels that have these features and no extensional features that h does not have. But ħ does not actualize any possible hotel with two lifts, or any other actual hotel. More generally, e actualises d iff the characterising features of d include those in given specifications or blueprints (if any) for e before e comes into existence that are consistent with those e has, and the extensional features of e property include those of d. Thus what e actualises are possibilia.[1] The presupposed notion of coming into existence is defined in chapter 2, where also many other problems and issues concerning dynamic objects and their logic are considered.

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[1] Objects also differ as to how they may be *conceived*, especially in what classes of features are ascribed to them. Contrast *full* objects which are conceived of as having all their features, with various *stripped* objects which have (i.e. are conceived of in this way) only some of their features, e.g. extensional features.

§26. *Acquaintance with the epistemic access to nonentities; characterisations, and the source book theory.* Both Meinong and Russell distinguished two main ways of designating and acquiring knowledge of objects: first, by acquaintance and ostension, and second, through description. For nonentities they both thought that only the second possibility is open - or at least that coupled with limited description-ostension devices such as pointing and adding 'Like ..., but ...'. It may then be tempting to conclude that (unless perhaps some items are undescribable) if b does not exist, then some description is a correct description of b. But both the premiss and the jump to the conclusion are mistaken. Firstly, so it will be contended, knowledge of nonentities may be obtained by a range of cognitive procedures, e.g. perception, imagination dreams, memory, inference. We encounter nonexistent objects all the time in our intellectual and imaginative activities and sometimes in perception (see especially 7.10 and 8.10). It is simply false that descriptions that are all that are available in discerning nonentities: they are only all that is available in describing nonentities, since analytically all describing is by description (in a generous sense). The ostension/description dichotomy is a false one, even as restricted to the explanation of objects to others. Secondly, only a few among objects are ever described: many nonentities will lack any actual descriptions, correct or not. But they do not thereby lack constitutions or natures.

Observe that a distinction can, and should, be made between the characterisation of (nonentity) b and characterising descriptions of b. A characterisation may be viewed as a liberalisation of the traditional notion of an essence: a liberalisation because a characterisation need not be bound by necessary and sufficient conditions, but can be open in the various ways Wittgenstein 53, Waismann 53, and others have remarked in their criticisms of certain essentialisms.[2] A characterisation may be represented (for example) by a fuzzy set of characterising properties.[3] Naturally characterisations (like other abstract objects; see 9) do not exist, any more than many of the objects they serve to characterise. Nor do objects reduce to their characterisations, though the idea of such a reduction has appealed to some philosophers (those of reductionist temperament who like to convert what are limited isomorphisms into identities). For objects have (categorially) different properties from their characterisations (as shown in later chapters, especially 8). The difference can be readily seen in the case of entities. Smart has a characterisation but is not a characterisation; joviality is not an element of him, though it may be of his characterisation.

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[1] The theory of items gives promise of providing an interesting formal treatment of other Aristotelian notions, in particular those of Aristotle's theory of potentialities. For potentialities are special sorts of possibilities of actual items.

[2] Such openness interferes with identity criteria neither for entities nor for nonentities. (It may interfere, however, with the application of such criteria.)

[3] Characterising properties are those that are specified by characterising predicates (both those that have tokens and those that do not but might).

Through an appropriate fuzzy set theory lies a ready way of taking account of several sorts of openness, and thereby of rebutting the common charge (made recently by John Passmore) that a theory of objects is bound to be (objectionably) essentialistic.

One of the by-products of attempts at linguistic reductions of nonentities, of nonentities or their characterisations to (characterising) descriptions, has been a decidedly misleading picture of nonentities, as if they were mostly, or all, relatively simple finite-sided objects. Such commonly ascribed features can be accounted for by the fact that natural language descriptions are necessarily finite. Any such linguistically specified nonentity, if it were only reachable by description, and exhausted by description would be limited to characteristics that can be finitely specified, and consequently will be incompletely specified with respect to all sorts of features, and generally finite-sided. Thus the renowned, but bogus, contrast between the almost infinite complexity of entities and the incompleteness and "shadowiness" of (linguistically specified) nonentities. The contrast is bogus because we are not limited to finite descriptions in finding out about nonentities, but have many other means, nor are we limited to the finite by finite descriptions used in characterising them, any more than we are similarly limited to finite cardinal numbers.

Much as a character in a work of fiction is characterised in the book, so more generally an object may be said to be characterised in a source book for it, or its characterisation given by a source book. For each object there is a source book which tells its "story" what it is like, what it does, and so forth. The source book is the source for characterising details of the object: it is not the source, of course, for what we think or feel about the object, for all intensional relations to the object. Any actually specified nonentity does have an actual source - whether it consists of what is written in books or documents, verbal or film material, or is in the form of plans, blueprints, specifications or the like. All these sources will be accounted source books or part of source books in the technical sense. For example, building specifications may function as the source book for a house which does not exist (and which may never exist). The role of the source book for an object in determining what is true or false of the object is explained by direct elaboration (with very minor adjustment) of Honoré's account of the role of specifications in characterising a projected house.

> Provided everyone understands we are not postulating the existence of the house we can happily say 'our new house has four bedrooms', 'I wonder if we have put the staircase in the wrong place', and so on, without fear of misunderstanding or of having failed to accomplish a proper speech act. The statements we make about the house may be true or false. If the specifications provide for four bedrooms, 'it has four bedrooms' is true and 'it has five bedrooms' is false. In fact the specification define the house. All that can be truly said about it must be continued in them or down from them by implication [in a very generous sense]. If the plans are changed the house changes (71, p.304).[1]

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[1] (Footnote on next page).

Likewise, so it is commonly and truly said, whether "Holmes smoked a pipe" is true or false according as it is specified in the source book for Holmes, which is compiled from Holmes' stories, whether he did or not; and it is true since it is specified that he did. Like specifications, source books can be vague or indefinite on various questions (compare a manuscript with some illegible or fully erased sentences). Like specifications also, source books may vary over time; and in a similar way one can speak of the source book for d at a given time, and the complete source book for a over all time. Some source books are closed, as is the source book giving the specification of Alice's unicorn, while others are presently open in that they may be continued. Some source books too have sequels. In such cases, the nonentity changes, as its specification or characterisation changes.

The account of truth determination by source books has to be a little more sophisticated however, as does the account of source books, which are ideal extrapolitions from actual books. For suppose the source books say, that Holmes exists, or the plans say that the building is to be found at a given location, when neither of these things are true. (Examples are easily multiplied: see 7.1). What will be said instead is this:- The source book delineates an objects with such-and-such features. In the world of the source book (the world determined by the statements of the source book), the object has these features. But which features it in fact has, has in T, as opposed to in the source book world, depend on its characterising features, and these features in does have (in T) as Characterisation Postulates assure. Thus a source book includes, like a story, much more than merely the characterising features, of its object.

Even in the paradigmatic case of a character portrayed in just one novel, the source book may not - generally will not - coincide with the novel, but will add to it statements that are not made in the novel but can be reliably inferred from the novel and are required in understanding it (cf. 7.1). In other cases the source book for a fictional object may depend upon several works in which the object figures.[1] The source book for a theoretical object will depend on a theory or complex of theories, which will provide part at least of the source book. The source book for an historical figure, for instance for Parmenides, is determined by how things were; by contrast our record will be compiled from a small set of writings, from what is said about the figure, and so on; in short, from the historical sources concerning the figure, that is, with what the historian works with.[2]

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[1] (Footnote from previous page)

What Honoré goes on to say (p.304), that 'non-existent objects are not phantom objects but represent the content of specifications or descriptions', amounts however to another mistaken reduction attempt. All that is true is that nonentities may be regarded as given by source books (or worlds); but in most cases the source books themselves will not exist.

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[1] Also a work of fiction is generally about several objects and more than one character.

[2] It is assumed that a source book is, like a work of fiction generally is, reliable as to its object(s). With past objects - as contrasted with perhaps future objects, such as Honoré's house - where records diverge from source books, the question of reliability does arise, for records; and it turns on comparisons of records and putative source book material.

1.26 THE THEORY AFFORDS NO REDUCTION

A source book, or source theory, like the world it delineates, may be represented by a set of propositions, some at least of which may be presented in a book (cf. the book of fate). For a nonentity no one has selected for consideration but few or none of the requisite propositions will be documented in any actual historical source. The source books of such objects are not actually-grounded. By contrast, the source books of nonentities that have been selected for presentation, consideration, etc., e.g. the objects of fiction, mythology and theories have actually-grounded source books.[1]

A corollary is that actual source books[2] or elaborations thereupon offer no viable route for a reduction of nonentities. It would be wrong to conclude that objects always answer back to source books which a referentialist can say exists. For there are many tales that are never told, etc. In other words, the situation is like that with propositions and real numbers. Told stories are like stated propositions or described really numbers; and untold stories - objects whose source books have not been set down in part - are like unstated propositions or undescribed or unselected real numbers (cf. undescribed species). Furthermore just as there are very many real numbers that remain unselected and many propositions that are never stated in any noninfinitary language, so many stories remain untold, many objects and characters are never selected. The numbers can be estimated. Even for real numbers the cardinality is non-denumerable. For propositions the cardinality is at least as large, for there is at least one proposition concerning each undescribed real number, namely that it is undescribed. In fact the cardinality is far larger since there is at least one proposition concerning each number, namely that it is a number. So there are at least as many propositions as ordinal numbers. But there can be no more for the number of propositions has a number and this can be no larger than the number of numbers. So the number is the number of numbers.[3]

The source book theory, as well as being invaluable in reflection upon fictional objects, offers a theoretical solution to the issue (which prompts "negative" CPs) as to which characterising properties it is not the case that objects have. The answer is: those that are not given in their source books. The source book theory also helps in explaining, what it was originally introduced to explain, the fact that many claims about nonentities are contingent, enough of them contingent truths. When only CPs are considered, this may look like a problem, since all truths so delivered about nonentities are necessary. It is not difficult to see however, especially given source books for nonentities, that intensional statements about nonentities are mostly contingent. The difficulty lies with extensional truths.

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[1] Thus Anna Karenina has an actually-grounded source book. The point enables Howell's second objection to Parsons' theory (79, p.133) to be met immediately. The source book theory also helps in meeting other of Howell's objections.

[2] Really those that have actual tokens.

[3] This is however in the region of Cantor's "paradox". And with the questions as to the number of source books we are in it. For consider the issue as to how many theories there are, noting that a theory can be represented as a set of propositions. The number of theories is (at least) 2 to the power of the number of propositions, that is 2^{NM}, where NM is the number of numbers, giving a number 2^{NM} strictly greater by Cantor's theorem than the number NM of numbers. NM is an inconsistent number, indeed a radically inconsistent object. On the paraconsistent theory such objects are unproblematic.

The key point is that source books are contingently source books for the named items, i.e. it is contingent that the source book for Sherlock Holmes is the one it is. Sherlock Holmes might have been a negro born in the U.S.A., in which case the source book would be rather different. So it is contingent that Sherlock Holmes has even the characterizing features ascribed to him by the source book. But how is this compatible with the necessary truth supplied by a CP that the man who did all the characterising things SH did (necessarily) did all these characterising things? The identity of SH with the man who did all the things Holmes did ... is extensional, and replacement of extensional identicals does not preserve modality; so what the identity will yield at best is that what is true is that SH in fact did all these characterising things.

§27. *On the variety of noneisms.* Basic noneism is the position which integrates into a logical framework the theses M1 - M7 (set out on pp.2-3) and other theses drawn from the Epicureans and Reid (see pp.1-2), in particular,

M8. Universals do not exist but they are something.

In order to include such theories as those of Castañeda 74 and Parsons 74, requirement M8, which may look more optional than it is, would have to be removed. So results what may be called 'minimal noneism'. But noneisms extending minimal noneism which replace M8 by the contrary thesis that some (or many) universals exist (as do both Castañeda and the earlier Parsons) are not really noneisms, but reductionist positions (see especially the argument of chapter 12). For such theories commonly admit, or are intended to admit, the reduction of nonexistent objects to (allegedly) existing universals (those the theory includes).

As soon as noneism is applied to resolve philosophical problems extension beyond the basic (or minimal) position is rather inevitable. For example, when the issue as to what can be conceived is considered, the upshot is (as Reid found in investigating the intellectual powers of man),

M9. It is false that whatever can be conceived is possible.

an upshot contradicting the opinions of almost all philosophers, but not of the ordinary man (Reid, 1895, p.369). At this point the commonsense features of noneism begin to appear: just how commonsensical the theory of items is is argued in chapter 6.

There is a more general position that application of basic noneism encourages, namely commonsense nonreductionism. It is in part for this reason that it is seriously suggested that 'noneism' can also be considered as a contraction on 'nonreductionism'. Basic noneism leads to nonreductionism, in the first place, because reductions are very often ontologically motivated. They aim to show that such and such objects whose existence is thought problematic but which are somehow required for a certain theory or discourse, can be reduced, or the theory or discourse in which they occur reduced, to an alternative (less problematic or) unproblematic basis, at the same time revealing that the objects in question either do not exist, or, though they do exist, are nothing importantly over and above things that do unproblematically exist. Theories of incomplete symbols provide reductions of the first sort, putative scientific reductions of the second sort, e.g. the physicalist reduction of minds to brain states.[1] The noneist finds however that the allegedly problematic objects, though indeed required for certain discourse, do not exist and have only been thought problematic because of referential assumptions that noneism rejects, and hence that the motivational bases for attempted reductions are removed: the objects may be contemplated, thought about and theorised about without ontological extravagance. The noneist also finds, on further investigation, that very many of the reduction proposals are extremely shaky and furthermore depend, for what little chance of success they have, upon assumptions antipathetic to noneism. In sum, an excellent case emerges, for rejecting such reduction proposals (see further chapter 12).

A fuller noneism is nonreductionistic in orientation, at least in rejecting such ontological reduction proposals. Fuller noneisms also develop noneism beyond the basic theses towards more comprehensive philosophical theories. Roughly, a fuller noneism - or simply noneism is what follows - is a conservative extension of basic noneism which rejects many philosophical reduction proposals (including those for reducing universals); thus fuller noneism is also nonreductionist noneism. It is also, as hinted and as it turns out, a commonsense position. It is difficult to be precise about exactly which reduction proposals noneism repudiates. Certainly not all scientific reductions proposals are being rejected; enough of these have turned out correct, e.g. the extensional identity of water with H_2O, of heat with a form of energy. But several sorts of philosophical reduction proposals will be encountered and rejected and subsequent chapters, e.g. phenomenalistic reductions of material objects to ideas, of theories to phenomena, etc. The scientific/philosophical distinction thus far leant upon will, however, bear scarcely any weight, and needs superseding. Similarly, what counts as a development is (deliberately) left vague: later chapters will illustrate some developments and indicate lines of other possible developments.

There are many lines of development of basic noneism. Enough of these choices have already been considered in detail, e.g. choice of descriptors and descriptor semantical rules, choice of quantifiers (whether LQ or LR style), extent of modalisation, extent of relevantisation, etc. Some of the choices between alternative lines are fundamental to the character of the theory and to the shape of its logic. Perhaps the most difficult and most far-reaching choice is that between consistent and paraconsistent noneisms. Consistent noneism is intended to be a consistent theory, and is presented as such. If the theory is found inconsistent it is either abandoned or else modified, in a way intended to remove source of inconsistency. Paraconsistent noneism allows for the possibility that the theory is inconsistent, and does not abandon or necessarily modify the theory if inconsistency is found. Consistent noneism aims to provide a consistent theory of inconsistent objects, paraconsistent noneism does not; and a dialectical, or inconsistent, noneism may explicitly aim to give - what may look more appropriate - an inconsistent, yet nonetheless nontrivial and sensible, theory of inconsistent objects. The choice between these types of noneism is (once paraconsistent theories are taken with due seriousness) a difficult one: as we shall see (particularly in chapter 5), each choice has its advantages and also its disadvantages, and an informed choice is at present hampered by lack of information, especially as to what can be accomplished in paraconsistent logics.

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[1] The falsity of many variants on the contingent identity equation, minds = brains, will follow from the theory of chapter 9. For brains exist, but minds do not exist, and 'exists' is transparent with respect to contingent identity.

Consistent and dialectical noneisms differ in the properties they assign to impossible objects, in particular as to the sorts of impossible objects the theories include, something which depends upon the strength of Characterisation Postulates for impossible objects. More generally, noneisms differ, often importantly, as to the types of objects the theories provide for, the varieties of properties and relations these objects have, and the inferences it is legitimate to make from their having these attributes. These are differences that come down in a full formalisation of a theory - something the present, partly genetic, theory of items does not entirely achieve, or, at the current early stages of logical investigation, really aspire to - to logical differences, to differences in such logical and semantical matters as the following:

(i) The range of values of the variables, especially the bound variables, of the theory, and associated with this the extent of domain d($\underline{\underline{T}}$), and, syntactically, the width of the class of terms that can instantiate the most general variables of the theory. This issue is a special case of the next issue:

(ii) The form of the underlying neutral logic, the carrier logic, i.e. the theory of implication and inference and the logics of parts of speech such as connectives, as distinct from the theory which specifies objects.

(iii) The axioms for objects of the theory, in particular the extent and type of Characterisation Postulates.

(iv) The theory of attributes and of classes of attributes of the logic, in particular the classification of properties and relations.

Theories of items may differ significantly in each of (i)-(iv); and it seems likely, that with the growing interest in such theories that logics of items will proliferate. Yet there is relatively little doubt where such logics should be tending, at least as regards some of the issues raised by (i)-(iv). Firstly, to consider (i), a logic of items should include as values of variables all objects, including all objects of thought, imagination, and so on. That it needs to do so to satisfy thesis M1 is not however entirely evident; for thing (in 'everything is an object'), on one common construal, means 'particular thing' and thus excludes objects of higher order. And a logic may build in, as second-order logic does, a crude typification under which attributes, for instance, which are objects and objects of thought, are excluded as things. But in the intended reading of M1, a reading enforced by the elaboration made as to the sorts of objects, thing is not so restricted. Higher order objects are objects, certainly, and also things (on the intended reading, and on a perhaps even more common construal of 'thing'). Thus neutral second-order logic, though a satisfactory logic for an important fragment of the theory of items, has to be superseded by a more comprehensive logic which places no such type restriction on objects. Such a logic structural logics can furnish.

Consider next issues raised by (ii). Ultimately a logic for noneism should include provision for all parts of speech natural languages may contain, and especially all connectives that may license inferences. For any part of speech may figure in a complex substantial phrase, and any such phrase may be used, with the intention at least, of presenting an object. So all parts of speech should be encompassed. In short, an eventual objective, which structural logics carry one far towards (as far as general format is concerned), is a logic adequate to discourse, a logic with a comprehensive grammar and semantics.

Consider finally (iii) and (iv). Again the eventual aim is a certain maximality, severely constrained maximality needless to say. For example, a theory that leaves out certain sorts of objects (as a consistent revision of noneism perhaps does) will be less adequate, at least in this regard, than a theory which does not. Again, a theory which blocks relations nonentities can have to one another, or the inferences that can be drawn from such relations, by its account of relations (as does Parsons' theory), is less adequate than one that does not. Naturally there are limits to this maximalisation. It is not to be achieved by trivialising the logic. Nor is meant by talk of classifications of relations endless multiplication of distinctions which are going nowhere of theoretical or taxonomic importance (which is what one sometimes seems to find in Meinong's work).

On the different roads to ultimate objectives there are many staging points. Different logics will result inasmuch as a theory of objects is taken as far as one or other of these staging points. So results a lattice of logics, with minimal elements corresponding to minimal and basic noneisms and maximal elements to ultimate noneisms. The class of logics is very large, and choice among the alternatives, so far as it is required, often a difficult business.

A choice associated with the paraconsistency choice - since relevant logics comprise an important class of paraconsistent logics - is the ir/relevance choice, whether the underlying logic of the theory is to be relevant, or irrelevant, e.g. classical or an extension of classical such as modal. A relevant noneism is one whose logical theory is a relevant one (strictly, one whose theory is a conservative extension of a relevant logic, something that it is hard to be sure of with complex theories).

The relevant/modal choice (with its associated arguments as to the correct substitutivity conditions for a wide range of philosophically important functors) may be seen as a special case of the ultramodal/modal choice. (Remember that classical substitution conditions are usually modal, being defined in terms of valid or logically necessary material equivalence.) The case for the choice of ultramodal noneism - i.e. of a noneism with a logical theory which provides (in the way that relevant logic does) logical replacement conditions tighter than a modal theory does - is substantial (in my view, overwhelming; for a main part of the case see UL and RLR; but see also 11.2). But the ultramodal choice leaves open the question whether the theory should include classical (and modal) logics as a part (i.e., in effect, should be an extension of consistent noneism) or not.

Radical noneism combines ultramodal and paraconsistent positions, with ultramodal noneism assumed to include relevant noneism; its logic is an ultralogic (i.e. some variant of the ultramodal logic of UL). The position toyed with in several places in later chapters is radical noneism. But whether this very promising-looking position can be sustained is not yet completely clear; as remarked, it calls for much more investigation. That is one of the reasons why it is important to keep options a little open, and to carry consistent noneism along in the theories produced.

CHAPTER 2

EXPLORING MEINONG'S JUNGLE AND BEYOND

II. EXISTENCE AND IDENTITY WHEN TIMES CHANGE

§1. *Existence is existence now.* Not all items that have existed or will exist currently exist: some, like Aristotle and Queen Hatshepsut, have ceased to exist, others, like the greatest philosopher born in the 21st century, do not yet exist. The fact that most of us really want to claim that purely past and purely future items do not exist, that Aristotle does not exist, is part of the case for the thesis

EO. existence is existence now.

For if an item does not exist now then either it never exists or it is purely past or purely future. But if it never exists it does not exist, and if it is purely past or future it does not, by the former points, exist. Therefore, contraposing, what does exist exists now. The converse of this, that what exists now does exist, is fairly unproblematical. For if any item exists now it satisfies whatever criterion of existence is adopted, and so exists. Again, if an item does exist now then it is existent (transferring the now into the tense), so it exists. The converse, that only what exists now exists, can likewise be presented as a grammatical transformation; if an item exists then it is existent, so it exists now. The thesis reflects a rationally-based determination to use 'exists' as a present-tensed verb, and not in some other way. But that is not all.

Purely past and purely future items are, like merely possible items, not (now) determinate in all extensional respects: hence (applying the results of 1.19) they do not exist. Compare the items Aristotle and Polonius, and remember Peirce's question as to how long before Polonius died had he had a hair cut and Russell's as to the baldness of the present king of France. Well, is Aristotle bald now? If he is, how long has he been bald? If not, how long since he had a haircut and how long is his hair? Since Aristotle has ceased to exist, it is false that Aristotle is now bald and false that he is not now bald, even on Russell's theory of descriptions naturally (i.e. temporally) construed. Thus Aristotle is indeterminate in respect of the extensional property of (present) baldness. Hence he does not exist now; hence he does not exist. Likewise the future sea battle is indeterminate in various respects, so even it if will exist it does not exist. Of course there are substantial differences between the various sorts of nonentities alluded to, between Aristotle (a past object) who did exist but does not now, the future sea battle (a future object) which will exist but does not now, and Polonius (a possibilium) who never existed.

Criteria for existence, which are not biassed by the Ontological Assumption, converge with common sense and natural language in the main claims made, in particular on EO. For consider what we do say and how we argue (before philosophers and positivistically-inclined scientists got at us).[1] We say, and say freely, such things as "Aristotle does not exist, he's dead", and we are prepared to argue, correctly, "Aristotle is dead. Dead men do not exist. So Aristotle does not exist". The same results emerge from other criteria for existence. Consider, for instance, the spatial test. Aristotle, like Polonius, does not have an actual location, a postal address, or identity card etc.; he is not to be encountered in Greece or anywhere else in the world.

Or consider in more detail the criterion tentatively adopted in 1.19, according to which existent items, entities, are completely determinate in all extensional respects. Since

(1) $xE \rightleftarrows . (U\ \mathrm{ext}\ f)\ (x{\sim}f \equiv {\sim}xf)$,

i.e. that item x exists logically coimplies that for all extensional predicates of x predicate negation and sentence negation coincide, and since

(2) x is $\sim$-indeterminate $\rightleftarrows . (P\ \mathrm{ext}\ f)\ (xf\ \&\ x{\sim}f)$,

i.e. that x is (negation-) indeterminate logically coimplies that for some extensional property x both has and lacks that property, it follows that if an item is indeterminate then it does not exist.[2] Hence again, since purely past and future items are indeterminate, are incomplete in many extensional respects (e.g. where they are lodging, what they ate for breakfast, what clothes they are wearing), they do not exist. Nor is the key principle (1) that is used a consequence merely of a stipulative definition of existence. Rather it derives from an explicative definition of existence; for there are independent arguments for the correctness of the coimplication (see 1.19). Equally important here, (1) cannot be thrown over by classical logicians since the special case of (1) needed in the argument holds classically. When confronted by names naming items not of acquaintance the classical logician typically eliminates these in favour of definite descriptions, in the way Russell has explained. Most names, including all names of purely future and purely past items, should strictly be replaced by definite descriptions since the items (purportedly) referred to are not items of acquaintance. Many later workers in the classical paradigm go further and insist upon eliminating all names in favour of definite descriptions. But for definite descriptions (as noted) a classical version of (1) holds. This is a consequence of PM, *14.32. After modification of scope conventions and predicate relettering and reordering, *14.32 reads:

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[1] Compare Putnam (67, p.240, my rearrangement):

> The main principle underlying the "man in the street's" view of the nature of time [is] as follows: (1) All (and only) things that exist *now* are real. Future things (which do not already exist) are not real...; although, of course they *will* be real when the appropriate time has come to be the present time. Similarly past things (which have ceased to exist) are not real, although they *were* real in the past.
>
> Obviously, we shall have to make some assumptions about the concept *real* if we are to discuss the "man in the street's" view at all.

If we make not Putnam's (relativistically-) loaded assumptions for which no motivation is offered (especially assumption III), but the commonplace assumption that what is real is what exists - which certainly coincides with one central sense of 'real', cf. OED - then what results from (1) is not Putnam's conclusion that future things are (already) real and, a conclusion Putnam does not draw, the inconsistency and incoherence of the man-in-the-street's view. (For 'future things (which do not already exist)' are real and also not real.) What results instead is, firstly, EO, that all and only things that exist exist now, and secondly a coherent view of the nature of time.

Putnam's position, which eventually vanishes into a tautology, is further examined below when the question of the reality of the future is considered.

[2] Almost all strict implications and coimplications can be replaced by entailments and coentailments, and in a more polished theory would be so replaced.

$$(\iota x\ xf)E \equiv.\quad (\iota x\ xf)\sim g \equiv \sim(\iota x\ xf)g$$

Then since g is not free on the left-hand side, and since all predicates of described items are supposed to be extensional (see PM, 182), (1') $(\iota x\ xf)E \equiv.\ (U\ \mathrm{ext}\ g)((\iota x\ xf)\sim g \equiv \sim(\iota x\ xf)g)$ follows. To argue the same point differently, if the x which has f exists then $(\iota x\ xf)\sim g \equiv \sim(\iota x\ xf)g$ holds for all g, and so, in particular, for all extensional g. Conversely, if the x which is f does not exist then $(\iota x\ xf)\sim g$ is always false and $\sim(\iota x\ xf)g$ is always true, by PM, *14.21; hence $\sim(\mathrm{ext}\ g)((\iota x\ xf)\sim g \equiv \sim(\iota x\ xf)g)$. It follows from (1') that $(P\ \mathrm{ext}\ g)(\sim(\iota x\ xf)g\ \&\ \sim(\iota x\ xf)\sim g) \supset. \sim(\iota x\ xf)E$, i.e. an item which neither has nor lacks some extensional feature does not exist. Therefore, since the Stagyrite neither has nor lacks various extensional properties, he does not exist; and likewise for all other purely past and purely future objects.

Similar arguments to those that support EO support the deductively equivalent thesis, nonexistence is nonexistence now. Adoption of EO need entail no loss in what can be said or argued. On the contrary, a great advantage accrues from the adoption of the thesis within the theory of items to be developed, that without loss of expressive power ontological commitments can be cut back to a correct and reasonable level. In particular, adoption of EO does not exclude continuity of times or a temporal continuum, as Williams mistakenly claims (Gale 67, p.114): continuity is however defined in a less ontologically obnoxious way than usual, using neutral quantification over times.

That past and future items do not exist is not the only corollary of EO. It also follows (with the help of minor lemmas) that past and future items, which are not present, do not exist, and that the past and the future do not exist. So much of what we talk of does not exist. Immediately acute problems are raised for the Reference Theory and for its associated logic, classical logic. For according to the Reference Theory what does not exist lacks an unproblematic meaning and cannot be truly spoken of, and according to a dogma of classical logic what does not exist has no true (primary) properties. But we constantly speak of purely past and purely future items, of the past and the future, and ascribe true properties to them.

Because purely past and future items both do not exist and yet have quite definite properties classical logic is inadequate to formalise discourse and arguments concerning past and future items. For it follows from classical logic (PM, *14.12) that no item which does not exist has any true properties. Similarly on other theories of descriptions they have no (or but few) distinctive properties. Accordingly, to accommodate logical discourse about purely past and purely future items a nonclassical chronological logic is essential. The advantages of neutral logic are really highlighted when chronological extensions are made, much as the advantages of an alternative theory to the Reference Theory really emerge when becoming and ceasing to exist are to be explained. Because the reference of 'a' may change over time, and because the reference of 'a' may even cease to exist and will eventually do so, a more satisfactory theory has to take account of change of reference, and of identity and existence, over lapse of time. To formalise such a theory properly, a neutral chronological logic is needed.

But not any old chronological logic will serve. Any suitable logic should satisfy certain conditions of adequacy (including those cited at the beginning of §4), and given these the inadequacy of all current theories can be seen.[1]

§2. *Enlarging on some of the chronological inadequacies of classical logic and its metaphysical basis, the Reference Theory.* Though Aristotle does not exist we can continue to talk about and signify Aristotle; though he does not exist now it is not nonsense (non-reference), but true, that Aristotle was born in Stagira, and taught Alexander. Aristotle has true properties - including the property of not existing, the property of having ceased to exist, etc.

According to classical doctrine on purely past and purely future items, names or descriptions such as 'Aristotle' and 'Man first born in the 21st century', (hereafter 'Manfibo'), since not signifying existing ostensible items, must be eliminated through descriptions. And all primary statements containing the resulting descriptions are false; for (short of an obnoxious and implausible platonism) Aristotle no longer exists and so does not exist, and Man first born in the 21st century does not yet exist, and so does not exist. The doctrine strictly construed is preposterous: it is true, not false, that Aristotle, who is a dead philosopher, was born at Stagira, and that Man first born in the 21st century is first born in that century.[2] On the strict doctrine even Caesar's classic statement on the division of Gaul is false.

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[1] This is not to disparage recent work in chronological logic; the researches of Prior and co-workers (reported in Prior 67) have notably advanced the subject. The present essay is especially indebted to the work of Prior and of Rescher.

[2] The correct classical response, made in fact by Prior, is that such statements as "Aristotle was born in Stagira" 'are not "primary" statements containing the description in question, but contain "secondary" occurrences of them, the form of the propositions being "it was the case that (Aristotle is born in Stagira)", so there's no ...reason...why they shouldn't come out true...'. Note that 1) the response does take it for granted that 'Aristotle' is not, what it appears to be, a name, but a (disguised) description; indeed it must be such, since names have (classically) no scope. 'According to Prior, 'Bucephalus' "can no longer count as a proper name" because Alexander's horse has ceased to exist'. However, as Hintikka goes on to remark (59, p.136, n.15), 'this implies the eminently unsatisfactory conclusion that the logical status of a name changes when its bearer dies'. The thesis that purely past objects cannot be named is considered further in §5.
2) the response blocks legitimate inferences, such as that to "Someone was born at Stagira".
3) the response fails against present tense ascriptions to past objects, as in 'Aristotle is dead', 'Aristotle is the author of Nichomachean Ethics', etc. All such ascriptions have to be paraphrased away; 'dead' declared like 'exists' not a predicate; etc. Canonical forms are fixed to fit the (failing) theory.

Nor can Aristotle and Alexander be values of subject (or individual) variables of standard quantification theories with identity. So it is not true on these theories that Aristotle is identical with Aristotle or was a Greek. Only by attributing to these items what they do not have - existence - could they be handled by the theories in some of the expected ways; and then other anomalies would appear. For example, it would follow that Aristotle is determinate in all respects, including present baldness, whereabouts, etc. For similar reasons moves to save the position by introducing some secondary sense of existence in which past items still exist is classically inadmissible; for these moves are inconsistent with such outcomes of the theory of descriptions as the indeterminacy of items which do not (primarily) exist. In any case the shuffle is much less inviting with respect to future items, since future items do not yet exist and never have.

On classical theory one cannot even make any true (primary) predictions about future items.[1] Classical theory raises intolerable problems for non-platonic architects, engineers and planners. Consider, for example, the hotel that will be built on site s, a hotel which has definite and approved specifications and plans but which does not yet exist. Among other things, the hotel will be built on site s. But since the hotel does not exist it is false, according to classical logical theory, that the hotel will be built on site s.[2] All primary predictions about future buildings are false.

Similar problems for the classical theory are raised by events that do not exist, for example Hitler's invading England in 1940. That such events do not exist should follow, even classically, from their indeterminacy: after all which day did Hitler invade, how many troops did he have? Yet just such events are important for counterfactual conditionals.

Not surprisingly classical practice does not square with the theory; there is a big discrepancy, and a good deal of double talk to try to close it. Clear examples as to the discrepancy are provided by Russell's and Carnap's work. In PM (e.g. 66-7), 'Socrates' and 'Scott' are treated as individual names, Scott and Socrates as individuals. But it is apparent from later work that this should be regarded as a temporary expositional expedient. For Socrates and Scott are not ostensively indicable now to any one; they are introduced rather by some sort of description or source book account. Socrates is in the same position as Homer (see PM, 175); 'Socrates' is not a logically proper name and should really be eliminated by way of a description. For one thing we can say of Socrates is that he does not now exist though he did exist a very long time ago. But according to Russell, of a logically properly-named individual we cannot significantly say that it exists, or that it does not. Thus 'Socrates' is not a logically proper name; and nor is 'Scott'. Socrates and Scott are not really individuals of Russellian logic. On the theory of Russellian logic indeed no purely past individuals are individuals of the logic. But classical practice appears quite different, and in applications of Russellian logic in ever-multiplying numbers of textbooks and in Russell himself (e.g. PM) we find purely past individuals taken as values of the variables, and thereby also licence to quantify over some of the past assumed. This practice is not warranted by the theory, and it cannot be correct. For, to illustrate, from the truth "Socrates is a citizen of ancient Athens" it would follow what is false - that there exists a citizen of ancient Athens.[1]

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[1] Thus Prior: 'no prediction is a "primary" prediction'. The severe difficulties in the development of this position are like those set out in the previous footnote.

[2] On the platonistic alternative now favoured classically, the hotel exists. Then why bother to design it or built it?

Taking advantage of the discrepancy between classical practice and theory we can present this dilemma: if the practice is followed we are obliged to accept as true many false existential statements; but if the theory is strictly pursued we are obliged to reject as false many historical truths.

The problem once again for classical theory is that familiar, often truthful, discourse, such as talk about the history or the future of the universe or items in it, does include quantification over items which do not exist. Not unexpectedly the same escape routes that are taken in dealing with difficulties raised by nonentities are again raised in the case of purely past or future items.

First, the platonistic strategies reappear.[2] Purely past items do in some sense exist. What sense? One piece of evasive action sometimes favoured is to introduce timeless existence, and a related ploy is the introduction of omnitemporal existence. According to the timeless existence move, even if Aristotle doesn't now exist, he timelessly exists. Where? How? This shuffle runs into the difficulties that face any escape according to which Aristotle still, in some sense, exists. For Aristotle, if he exists, is a concrete individual: it is significant to ask of him, if he exists, where he is to be found, what his current properties are, and so forth. But as we know, Aristotle isn't now to be found anywhere. We can't say what he now has for breakfast, or what he thinks of Prior's tense logics. In these respects Aristotle is indeterminate, like a nonentity. Nor does the timeless entity Aristotle satisfy usual requirements for existence. Against this universal item Berkelian jibes can be made. What height does he have; the height Aristotle had when 10 years old, or the maximum height Aristotle attained, or the height he had when he died? The actual Aristotle died, the timeless Aristotle presumably did not since otherwise he would not be timeless and would have ceased to exist. Was there a time at which the actual changing Aristotle and the timeless Aristotle coincided? If so, when? If not, what has the so-called "timeless Aristotle" got to do with Aristotle? The problems regarding purely future items are even worse. Enough has been said to make it plain that talk of timeless existence of individuals so far from being a varible escape route leads to considerable difficulties and soon involves heady metaphysics.

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[1] As always there is a classical response, made again by Prior: 'It isn't a truth that "Socrates is a citizen of ancient Athens (in fact no one is) - he was one'. Similarly it is false that Socrates is a philosopher, false that Socrates is smarter than Rescher and also false that Rescher is at least as smart as Socrates, etc. To arrive at the truths such "philosophically-misleading" statements are intended to express, two stages of regimentation are prescribed, retensing with the insertion of extra verbs where required, and removal of pseudo-names, such as 'Socrates'.

[2] These have enjoyed more plausibility than they might otherwise have had because of the Minkowski pictures of relativistic theory. Some of the philosophical shortcomings of Minkowski representations are indicated below.

In fact the timeless Aristotle, since *indeterminate* in so many directions, does not exist, even classically; hence the timeless Aristotle, whatever he is like and however he differs from the timeless Plato, cannot with his timeless mates uphold the classical theory (as strictly construed). For if the timeless Aristotle does not exist, then Aristotle does not exist timelessly:[1] so timeless existence does not reinstate Aristotle as a value of classical variables or as an item having true properties.

Furthermore, what is correct about timeless existence can be replaced by discourse either about existence at all times or existence at some time. For example 'a past time timelessly exists' can be paraphrased by 'a past time exists at some time'. But nothing is correct about existence out of time or existence without time. For d exists out of time if, by EO, d exists now out of time - a conceptual muddle. Nontemporal (mostly Humpty Dumpty) senses of existence can be defined in terms of omnitemporal existence, or sometime-existence, or by abstraction from times. No such manoeuvres work as escape devices: they all, in virtue of PM, *14.21, ascribe either too many or too few properties to Aristotle. Consider what happens with omnitemporal existence.

Many of the difficulties that afflict the attribution of timeless existence to Aristotle likewise render the ascription of omnitemporal existence to Aristotle quite implausible. For if Aristotle exists omnitemporally, he exists at all times, and so exists now. Well, then, what sort of features does this unlocatable but currently existing Aristotle have? Is he bald, at least 2,000 years old and something of a medical wonder? Like the timeless Aristotle, the current Aristotle of the omnitemporal subterfuge does not exist because he is radically indeterminate; for the same reason this Aristotle is of no more avail to the classical theory than Phoebus, the bringer of light.

Nor does "sometime-existence" afford an escape. For sometime-existence, existence at some time, is not a kind of existence; sometime-existence does not entail existence. While *sometime-existence* is an admissible notion for noneism it is not for other theories without a heavy injection of platonism. For an object that has sometime-existence, such as Aristotle, at most times does not exist. Hence it is not a value of classical bound variables, and not open to classical logical assessment, etc.

The sempiternal hypothesis, that if an item exists at some time it exists always - symbolised $(Pt)(xE,t) \to (Ut)(xE,t)$ - is sometimes assumed in an attempt to rectify the classical theory. But since the sempiternal hypothesis entails omnitemporal existence it does not rectify matters at all. Because it is inconsistent with the EO thesis, and because it entails omnitemporal existence, the sempiternal hypothesis is false.

Finally, as is well-known (and as Prior 67 nicely explains, p.139), platonistic salvage operations lead to many unpalatable theses inconsistent with the thesis that existence is existence now and with commonsense, for instance Barcan-type formulae such as $F(\exists x)x \strictif (\exists x)Fxf$ (e.g. if it will be the case that there exists a man who proves Fermat's last theorem, then there exists a man who will prove Fermat's last theorem!) and $(\exists x)xf \strictif P(\exists x)Fxf$ (e.g. if there exist a breeder reactor then it was the case that there exists an object that will be a breeder reactor!).

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[1] The logical transformation used at this point of the argument is usually conceded.

In characteristic opposition to platonism, reductionist moves reappear. According to nominalistic moves discourse concerning purely past items can somehow be reduced to or paraphrased by talk about present entities. That such a move has little to commend it and encounters serious difficulties has been explained at some length by Ayer 56.[1] The idealist strategy which attempts some reduction through memory and remembered items has likewise been implicitly criticised by Ayer. Neither reduction resolves the problem of quantification over past items unless past items are also eliminated. And this is what would have to happen. On nominalistic reductions Aristotle is typically eliminated by way of the name 'Aristotle', and on idealistic reductions through the idea or concept of Aristotle. It is easy to make difficulties for both these sorts of elimination; for the first by variations on "It is contingently true that 'Aristotle' names Aristotle"; and for the second by variations on "Their idea of Aristotle bears no resemblance to (is different from) Aristotle". The reductions normally make no effort to cater for, what are even more recalcitrant, purely future items.

The Reference Theory is at least as vulnerable to the foregoing criticisms as classical logic which it metaphysically underpins. For the Reference Theory leads to the principles, worked into classical logic, which result in the chronological inadequacies of classical logic. But a larger charge is laid against the Reference Theory, which subsequent sections do something to substantiate. It is that very many, indeed most,[2] problems in the philosophy of time are a product of the Reference Theory. Indeed the Reference Theory has done an immense amount of damage in the philosophy of time in diverting attention away from the obvious commonsense answers to puzzles over time and change.

§3. *Change and identity over time; Heracleitean and Parmenidean problems for chronological logics.* The traditional problems and solutions, both western and eastern, to the problem of change, and especially of the wheel of life, of birth and extinction, are set within and shaped by the Reference Theory. The basic assumption is that things cannot really go in and out of existence, since we can go on thinking, talking and conceptualising about them. The classical western position is well summed up (though in a slightly different context) by Reid (1895, p.370; see also p.372, p.374):

> The universe must be made of something. Every workman must have materials to work upon. That the world should

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[1] Actually Ayer treats the related problem of verification of statements about the past. But the verification difficulties arise of course from the non-existence, and therefore nonlocatability, of past items; and the attempted analyses to guarantee verification coincide with those designed to secure talk of past items.

[2] Most, but not all. The theory of relativity, at least in the hands of empiricists, is second only to the Reference Theory and classical logic in generating such spurious problems.

> be made out of nothing seemed to them absurd, because everything that is made must be made of something.
>
> Nullam rem e nihilo gigni divinitus unquam. - LUCR.
> De nihilo nihil, in nihilum nil posse reverti - PERS.
>
> This maxim never was brought into doubt; even in Cicero's time it continued to be held by all philosophers. What natural philosopher (says that author in his second book of Divination) ever asserted that anything could take its rise from nothing, or be reducted to nothing?

The characteristically western metaphysical solution was through an underlying substance (such as Aristotle's prima materia) which persisted: the typical eastern metaphysical solution was through a life cycle theory. On both metaphysics the result was that things do not really come into and go out of existence but are simply transformed into something else, as a brass pig may be wrought into a brass monkey.

Except insofar as the maxim reflects an early formulation of a conservation principle, it is mistaken. The problem is engendered by a mistaken insistence, in accord with the Reference Theory, in existentially-loaded quantifiers. Otherwise, and unproblematically, something existent can come into existence from nothing existent but something nonexistent.

The Reference Theory also engenders serious problems concerning change and identity over time, problems going back to Parmenides and Heracleitus. Two important connected conditions of adequacy on a philosophical theory of time and on chronological logics are these:

First, it should be possible to assert truly sometimes that x at t_1, is the same as y (or x) at a different time t_2, and yet that the item has changed over time.
Identity and change over time should be compatible. For instance, we should be able to say truly that Russell in 1911 is the same man as Russell in 1968 though Russell has changed over the years. But both Heracleitus and Parmenides have arguments to show that this is impossible.

Second, is should be possible to assert truly that an item has come into existence or has ceased to exist. But Parmenides has an argument to show that this is impossible, and this argument can be developed so as to vitiate chronological logics based on classical logic.

Consider first Heracleitus's thesis that everything is in constant flux or change: that no individual thing persists. Suppose for a reductio argument that some item a does persist, say from time t_1 to time t_2. But then a at t_1 would have a different property from a at t_2, for example existing at t_1 (using EO and $t_1 \neq t_2$), or being in a certain state or position p (see Aristotle's comments on Heracleitus). Therefore, by Leibnitz's identity principle a at t_1 differs from a at t_2 since a at t_1 has different properties from a at t_2. Therefore a changes from time t_1 to t_2 since its properties vary, and therefore a does not persist. For a is not the same at t_1 as at t_2 entails that a has changed from t_1 to t_2; and conversely a has changed from t_1 to t_2 entails that a at t_1 is distinct from a at t_2. Finally if a at t_1 is distinct from a at t_2, a does not persist from t_1 to t_2 (cf. the river fragments of Heracleitus, in Freeman 47).

Now (classical) Leibnitzean identity just does lead straight to Heracleitus's outrageous thesis. Classical logic provides no ready-made escape. However, it is not hard to find a way in which the classical logician can escape the Heracleitan flux argument. For Leibnitz identity only requires coincidence of all properties, and the classical logician can simply extend his dogma according to which existence is not a property to the dogma that existence at a time t is not a property.[1] In this way he avoids the argument presented on behalf of Heracleitus. Actually the escape is not quite so simple: first the Russellian is obliged to classify as non-properties various other features that may be used to distinguish a at t_1 from a at t_2; second he is at pains to develop a satisfactory account of a's change (or to explain how something can come to exist or cease to exist). For as a's change is not in respect of properties, classical logic cannot be applied to yield implications about change (e.g. we are not strictly entitled to argue: if a changed from t_1 to t_2 then something changed from t_1 to t_2).

Yet the usual requirement on change seems, at first glance, correct: a change from t_1 to t_2 if a at t_1 has some property that a at t_2 does not have, or conversely.[2] A logically equivalent account of change is offered initially by Russell:

> Change is the difference, in respect of truth or falsehood, between a proposition concerning an entity and a time T and a proposition concerning the same entity and another time T', provided that the two propositions differ only by the fact that T occurs in the one where T' occurs in the other (37, p.469, my italics).

There is a serious tension in this account; namely that under conditions where change occurs the entity cannot be the same according to Leibnitz identity. This difficulty Russell does not meet; what he does say is that his definition requires emendation if it is to accord with usage, since 'usage does not permit us to speak of change except where what changes is existent throughout'. This is false. Orlando changed over time; when someone is killed he changes; when a plant dies or is burnt it changes. The fact is that classical logic is simply unable to handle adequately changes in which some items come to be or cease to exist. Classical logic even when extended chronologically, in the way Russell and Carnap for example have extended it, not only does not provide any solution to the problem of identity with change over time, but by its adherence to a Leibnitzian identity principle and its legislation on properties precludes itself from easily providing a solution.

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[1] Naturally on the theory of items, existence at time t, like existence, is a property.

[2] Occurring at t_2, for example, will not do as a distinguishing property; for if the items are the same they may both have this property.

Part of the trouble is due to the complete unsatisfactoriness of the Leibnitz theory of identity. The Leibnitz theory of identity depends for its support on the Reference Theory and good reasons for adopting it vanish once the Reference Theory is abandoned (see 1.11). But for identity of changing items at different times extensional identity too requires elaboration. Extensional identity though satisfactory for contingent identity of items at the one time, has to be replaced by extensional identity over time, since extensional identity is inconsistent with change. For extensional identity over time the class of preserved properties must be further restricted to what will be called (sufficiently) dated properties. For example the boy of 1958 is extensionally identical with the man of 1968 because they both have the dated extensional properties of being 5' tall in 1958 and 6' tall in 1968, 10 years old in 1958 and so on. But the individual has changed for the boy of 1958 has the undated extensional property of being 5' tall but the man of 1968 does not have this property. Briefly
$(x,t_1) = (y,t_2) \leftrightarrow. (U \text{ ext dated } f). (x,t_1)f \equiv (y,t_2)f$,
i.e. x at t_1 is extensionally identical with y at t_2 iff they share all sufficiently dated extensional predicates. These details indicate the way in which the theory of items can solve the logical problem of identity throughout change.[1]

The usual requirement on change needs, like Leibnitz identity, amendment; for a does not change from t_1 to t_2 just because of someone's belief or knowledge of a change from t_1 to t_2. An improved account runs thus:
a changes from t_1 to t_2 iff $(P \text{ ext } f). (a,t_1)f \ \& \ (a,t_2){\sim}f$.
On the theory of items an item which ceases to exist or comes to exist thereby changes. For if an item ceases to exist between t_1 and t_2 say, it will be indeterminate wrt some extensional property f at t_1 and determinate wrt this property at t_2. Hence a changes.

Parmenides' argument for his thesis that change is impossible, that everything steadfastly is, is, from a referential standpoint, at least as formidable. The argument for the impossibility of change splits into subarguments of independent interest:-

(1) Coming to be (exist) is impossible.

For suppose that a came to be. Then a must come to be either from what is or from what is not (does exist). But a cannot come to be from what exists already; for this contradicts 'coming to be'. Nor can a come to be from what is not, for from what is not nothing can come to be. For (by the OA) what does not exist has no features, and so cannot sustain the performance of coming to be. Thus Aristotle writes 'from what is not nothing could have come to be (because something must be present as substratum)'. An existent substratum would of course guarantee properties (hence later substratum theories[2]); but nonexistence likewise excludes a present substratum.

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[1] The matter of distinguishing dated properties remains, but the preanalytic notion is clear enough for present purposes.

[2] As noted, the power of these referential considerations helps explain the popularity of substratum theories which guarantee properties and of rearrangement theories, got by weakening Leibnitz or settling upon resemblance instead of identity. As Wittgenstein correctly emphasized (in 53), substratum and substance theories are based on the Reference Theory (of

(continued on next page)

A similar argument tells against starting to exist (contrary to Prior, 67, p.139). For suppose a starts to exist at t_1. Then firstly a has the property of starting to exist at t_1, and secondly at $t_1-\delta t$ a does not exist. Hence at $t_1-\delta t$ a has no (true) properties, by the Ontological Assumption. Hence a does not have any properties associated with starting to exist at t_1, and in particular does not have the property of starting to exist at t_1 – a contradiction.[1]

(2) Ceasing to be (exist) is impossible, by an argument similar to (1).

(3) Change entails coming to exist or ceasing to exist.

Suppose item a changes from time t_1 to t_2, where t_1 is earlier than t_2. There will be a time (t_2 itself) when t_2 is present time and t_1 is in the past: consider a's change from this perspective. By the requirements on change a has a property now which it did not have formerly. Hence the past a is strictly different from the present a, so the existence of one does not guarantee the existence of the other. Since existence is existence now the different past a does not exist whereas the present a does exist. Thus in changing a comes to exist.

From (1), (2) and (3) it follows

(4) Change is impossible.

(5) What Is Is, Being Is. Since Being is the whole of what is, this thesis may be interpreted:

the sum total (fusion) of all entities exists and never alters. The argument is this: The sum exists since each part exists. The sum never alters for if it did some part would come to exist or cease to exist, which by (1) and (2) is impossible.

Parmenides' argument has sometimes been represented as an early piece of science supporting a physical conservation principle to the effect that creation of matter ex nihilo is impossible. This is an error: it would not then exclude the impossibility of movement or change of position or alteration of colour, all of which Parmenides thought he had established. No, Parmenides' argument is a metaphysical argument, based on the Reference Theory. Hence the relevance of Parmenides' pronouncements that we cannot speak or think about what is not or think that what is not exists.

To make it clear that Parmenides' arguments strike at the heart of modern chronological logics the arguments have been reconstructed using only weaker assumptions, consequences of the Reference Theory and established parts of classical logic and the calculus of individuals, together with the EO thesis. It has been argued that rejection of EO leads to grave difficulties; so rejection of this thesis is not a viable way of avoiding (3) and (4) above. Moreover its rejection does not provide an escape from (1), (2) and (5).

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[2] (continuation from page 11)

meaning). With the noneist abandonment of the Reference Theory the point of problem-making rearrangement and substratum theories disappears.

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[1] Given the RT, items which start and stop existing gain and lose all their properties!

Hence the further thesis:
Classical logicians are stuck not just without a satisfactory chronological logic; they *are stuck with Parmenides' changeless universe*. Is there an escape? Of course: there are always escape routes of *some* sort. But the main escape - apart from the already repeated chronological platonism which has it that everything that at some time exists exists timelessly, and so yields its own changeless universe, paradigmatically Minkowski's modernisation of Parmenides - is methodologically unsound and at a serious cost. The escape involves further curtailing the class of predicates which express properties. It is not just that existence is said not to be a property, and likewise existence at t for any time t. Becoming, coming into existence, dying, ceasing to exist, perishing, persisting, being killed, being conceived, spontaneously combusting, and so on: none of these are properties, indeed *no change feature* with relevant connections with existence *is really a property*. For by the Parmenidean argument (3) every change feature entails coming into existence or ceasing to exist at some time. Hence these implausible theses into which the classical logician is forced:

(I) No change or existence feature is a property. Consequently any theory based on *classical logic is inadequate to treat of change fully*. For as change features are not properties predicate logic cannot be applied forthwith to change features.

(II) All features that nonentities truly have are nonproperties (unless these features can be re-represented as secondary properties). (II) has been considered before (ad nauseam).

Classical logic incorporates, at the interpretational stage, a property filter, which filters out features, which apparently falsify the theory, as nonproperties or not traits. Plainly this property-filter is a theory-saving device, and is methodologically unsatisfactory. A serious deficiency of the classical escape from Parmenides is that the distinction between predicates which express properties and those which do not gets increasingly hazy. Classical doctrine needs to be underpinned by a technical distinction between properties and nonproperties. Until this is done part of the theory remains insufficiently assessible and falsifiable. Yet it is not easy to see exactly how the distinction should be drawn or can be satisfactorily drawn.

With the theory of items, however, Parmenides' arguments are easily halted. The argument under heading (3) depends on taking identity of items at different times as at least extensional coincidence on all properties. As this requirement has been rejected, for reasons already advanced, the argument fails. The argument itself provides a further reason for abandoning the usual account of (extensional) identity as applying to identity over time. The remaining arguments are premissed on the Ontological Assumption. As against these arguments, nonentities do have definite properties, and sometimes the properties of being about to exist or of starting to exist within time δt. Hence becoming and ceasing to exist are perfectly possible, and illustrative examples can be consistently added to the logic. Becoming is E-coming, coming into existence (see OED for this sense), and relevant logical notions are easily defined in terms of terminology soon to be introduced; for example:-

x first comes into existence at $t_1 =_{Df} (t)(t < t_1 \supset. (x{\sim}E, t))\ \&\ (xE, t_1)$.

x (simply comes into existence between t_1 and $t_2 =_{Df} (x{\sim}E, t_1)\ \&\ (xE, t_2)$. This entails that qu(x) has a referent at t_2 but not at t_1. Everything existent first comes into existence at $t =_{Df} (x)$.

$[(xE, 0) \supset (t^1)(t^1 < t \supset. \sim(xE, t^1))]$ &. (xE, t). Etc.[1] These definitions of neutral logic refute incidentally the thesis (advanced, e.g. by Godfrey-Smith 76, p.401) that such definitions require tensing.

§4. *Developing a nonmetrical neutral chronological logic.* The key to neutral chronological logic, and therewith to the solution of several hoary traditional philosophical problems, is neutral quantification over times without commitment to the existence of past and future times and objects, temporal instants, etc. Thus neutral chronological logic builds on neutral logic enriched by specific temporal variables.[2] To extend neutral nonchronological logic to a full chronological logic an at-relation is introduced. Let us add to the logic of items (of chapter 1) the primitive @ - read 'at', or sometimes 'in', 'on' or 'of' - which conforms to the formation rule:

> If A is a wff and s is a singular subject then (A@s) is a wff - written alternatively (A,s) where s is a temporal term.

@ can be viewed as projecting A onto a scale, coordinate or map system of which s specifies a part. Some examples are:- He was killed at 10 o'clock on highway 9; H weighed in at 10 stone; J cornered at 100 m.p.h. at Horseshoe Bend; It is hot in Uganda in summer. It is easy to wind up with nonsense by taking inappropriate subjects as in 'H weighed in at the author of Waverley', 'Uganda is hot at David Hume': this feature will be exploited in defining Time.

The preposition at gives a fundamental logical operation (from wff and subject to wff) for the development of formal theories of time, space, motion and matter (see Russell 37, e.g. p.465; also Quine WO, pp.172-3, Łoś as reported in Prior 67, p.212, Rescher in Gale 67). Whereas Russell observes (at least in 37) that 'at' is indefinable, Quine claims (WO, p.172 and p.104) that, where x is a spatio-temporal object and t is a time, x at t can be construed as the common part of x and t. Quine's proposal is defective. Were it right atness like the common part and interaction relations would be symmetric. But as Russell, nearer right, remarks (37, p.465) the at-relation is (significance features neglected) asymmetrical and intransitive. Quine's construal of atness in terms of juxtaposition is similarly defective. Comparisons like the following reveal the inadequacy of Quine's constructions. Compare 'the moon at 2 o'clock' with '2 o'clock at the moon'; the difference, and the non-symmetry, can be emphasized by coupling each sentence in turn with predicates like 'is photographed' and 'is round'. Or consider '10 o'clock at Eastern Australia (at EA time) is 12 o'clock at New Zealand (at N.Z. time)"; if the relation were symmetrical it would follow "Eastern Australia at 10 o'clock is New Zealand at 12 o'clock" or what is just as bad "E.A. time at 10 o'clock is N.Z. time at 12 o'clock". Goodman (in 77) does define at-connexions in terms of W, read 'with', but even in the calculus of individuals W is taken as a new primitive. Also Russell (in 36) defines the special 'at' he requires in terms of membership 'ϵ'; but the interconnexion does not hold generally. For the logical properties of @ are different from those of ϵ; many of the generally accepted properties of ϵ, as given by set theory postulates, fail for @. Despite some similarities to predication, @ cannot be reduced to predication any more than to membership, and conversely predication cannot be eliminated in favour of atness, for at least an 'is at' copula must remain.

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[1] Thus the Hegelian doctrine of Becoming as a transition from Nothing into Being is correct, and the "Principle of Sufficient Reason", that Nothing comes from Nothing, false, under the intended (existential) construal of quantifiers: under other construals it is different.

[2] It does not exclude a tensed approach, but combines with such.

Temporal qualification is a special sort of at-projection, namely qualification with respect to times. To distinguish such qualification and to bypass the complications of a significance filter in the main subsequent developments, time variables t, t^1..., t_1... are introduced. Time variables have as substitution-range such expressions as 'now', '10 o'clock', 'last week', '1964', 'when Caesar died', 'before the end of the last week of 1968', 'between 2 and 3 o'clock Greenwich mean time', '10 years ago'. In some cases an at must be elided (in English) in forming A @ t. These new variables, time variables, are eliminable in suitable set-ups by way of restricted variables and the predicate 'is a time' for example, within a significance logic the expression (A, t), i.e. A @ t, can be eliminated in context by T xtime ⇀ A @ x[1]. Thus (Ut)(A, t) is replaced by (Ux)(T xtime ⇀ A @ x).

Can the predicate 'is a time', used in the elimination, be defined? Given the relation < of temporal precedence the following definition can be tried: xtime $=_{\mathrm{Df}}$ (∃y) S (x < y), i.e. x is a time is defined: for some y it is significant that x temporally precedes y. Then 10 o'clock is a time, 1964 is a time, now is a time. But the definition is too liberal; for under it events such as Clay's knocking down Patterson also count as times, and Locke and the model T Ford are times, for example Locke because he was temporally earlier than Hume. An improved definition which appears to escape these difficulties is this:

T xtime $=_{\mathrm{Df}}$ (Up)(Sp ⇀ S(p @ x)) & S(∃y)(x < y).

Since this definition in effect assumes that

D. St & Sp ⥽ S(p @ t),

i.e. whenever both qu(t) and qu(p) are significant qu(p @ t) is significant, and so in particular supposes that truths of logic and mathematics are significant at times, it invites objections. For example, Smart's theory of time leans heavily on the contrary thesis to be criticised shortly, that truths of mathematics and logic are not significantly asserted when temporally qualified (see 63, pp.133-131). In D, St $=_{\mathrm{Df}}$ (∃q) S (q @ t), i.e. qu(t) is significant iff for some sentence qu(q), qu(q @ t) is significant. To defend D, first make the familiar separation of English declarative sentences into those that are temporal, like 'Socrates is smoking', 'Tom beat Bill" and 'The next glacial period is in the remote future', and those like, '2 + 2 = 4', 'Scarlet is a determinate form of red', 'Murder is wrong', 'Numbers don't exist' and 'The circle cannot be squared (by ruler and compass techniques)', that are nontemporal (often misleadingly called tenseless sentences). This distinction can be given some precision along lines suggested by Broad (in Gale 67, p.123), namely temporal sentences are those such that their truth or falsity depends on their (possible) time of assertion. On this account compound sentences like 'Tom either beat Bill or did not' are nontemporal. Subsequently the characterisation is taken up through the implication (for significant sentences),

A is nontemporal ⥽. (πt).(A, t) ⥼⥽ A,

which in turn coentials a generalisation of Broad's account,

A is nontemporal ⥼⥽. ($\pi t_1, t_2$).(A, t_1) ⥼⥽ (A, t_2) ;

but for the time being such a characterisation assumes the point at issue.

In arguing for D, there is little (not no) loss in generality in concentrating on grammatically simple sentences; for if D holds for such sentences then D can be proved inductively for compound sentences using such significance compounding principles as $S(p \mathbin{\&} q) \leftrightarrow Sp \mathbin{\&} Sq$, $S(a \text{ believes } p) \rightarrow Sa \mathbin{\&} Sp$, etc. Since there is little doubt but that D holds for grammatically simple temporal sentences it remains to haggle the case for simple nontemporal sentences. Such sentences as '2 + 2 = 4 now (at midnight)', 'The circle cannot ever be squared' are ordinarily treated as significant, so it seems from a limited sampling, and it is important that they should be so treated, for several reasons.

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[1] The notation from significance theory in what follows is that of Slog.

First, ruling such sentences out as nonsignificant would preclude normal application of the statements, for example to empirical subject matter. Simplified situations can be envisaged where the grocer, say, argues in this sort of way: I have two flagons of claret here, and I've two more out the back; two and two are four now; so I now have four flagons of claret in stock. Similarly the student applying classical mechanics to solve a standard problem involving cylinders rolling on one another needs to know that the mechanical laws, as well as the arithmetical, apply at the times in question, and needs to apply them at the relevant times. We remonstrate against the man trying to square the circle, or to devise a decision procedure for full quantification theory: Don't you understand the circle can't be squared; therefore it can't be squared today - so you might as well pack up - or tomorrow - so it's a waste of your time to start trying again then, or ever! Second, empiricist theories of arithmetic and idealist theories like Kant's and neo-intuitionistic theories according to which arithmetical statements involve a reference to time presumably cannot be refuted simply on significance grounds. Third, in virtue of logical transformations such as substitutivity of identity, temporal qualifications of many necessary statements can be derived. Consider, to illustrate, the following argument: The number of planets is 9 at present; the number of planets = 9 (or 4 + 5); therefore, by substitutivity of identity, 9 is 9 at present, and 9 = 4 + 5 now. By a similar argument, starting from the fact that Jupiter has 4 moons at midnight tonight, it follows that 2 + 2 = 4 at midnight tonight. A different set of transformations with the same outcome goes as follows: 2 + 2 = 4 is true at midnight tonight, since it is always true; so at midnight tonight 2 + 2 = 4 is true; so at midnight tonight 2 + 2 = 4; hence 2 + 2 will equal 4 at midnight tonight.

One reason why some philosophers are reluctant to concede that necessary truths such as 2 + 2 = 4 can significantly be temporally qualified, is that they think that such a concession will commit them to assertions like 2 at midnight + 2 at midnight = 4 at midnight, and thereby to the significance of phrases like '2 at midnight'. But such commitment would follow only given the correctness of transformations like $(x\ f, t) \simeq (x, t)f$; and such transformations are not generally correct, as the example under discussion already indicates (and is explained below).

Once the predicate 'is a time' is satisfactorily defined, Augustine's famous question 'What, then, is Time?' can be answered, though the answer may not appear very illuminating. Time is a property - of times - of 1984, midnight, doomsday, Spring, and when the lark sings in the meadow - much as Number is a property of numbers. Accordingly, $\text{Time} \equiv \lambda x\ x\text{time}$, i.e. Time is strictly the property of times; or, more specifically, $\text{Time} \equiv (\iota f)(Ux)(xf \equiv T\ \ x\text{time})$, i.e. Time is the property of all and only those items that are truly times.

The familiar circularity objection will be fired at this definition. To define 'T xtime' the primitive notion of temporal precedence was isolated; but temporal precedence is precedence *in time*. To meet this objection the requirement that < be a *temporal* precedence relation is abandoned: let '<' simply read 'precedes'. The adequacy of the definition of 'is a time' to exclude spatial locations as times when the temporal requirement on precedence is dropped depends on facts such as the unidimensionality of the time sequence as opposed to even 2-dimensional space (compare Broad, in Gale 67, pp.119-20), and the non-locatibility spatially of certain mental phenomena which are temporally ordered.

In what follows sortal variables t, t^1 ... for times are used (they can be eliminated as restricted variables through the predicate 'is a time'). The basic logic is an extension of that in chapter 1 - without significance. The logic is extended to embrace new wff containing @ and to include neutral quantification over times.

Since expressions of the form (A, t), $B \mathbin{@} t^1$ are wff, the logic includes as wff $((Ux)\, xf, t) \mathbin{\&} ((Px) \sim xf, t^1)$, $(p \mathbin{\&} q, t) \strictif (p, t)$, etc. Alternatively (p, t) could have been introduced as a primitive wff, just for sentential variables, and truth-functions introduced recursively by definitions like: $\sim(A, t) =_{Df} (\sim A, t)$, $(A, t) \mathbin{\&} (B, t) =_{Df} (A \mathbin{\&} B, t)$. (Compare PM, *9.) But this method lacks generality: no means of introducing $(A, t) \mathbin{\&} (B, t^1)$ is available and there is no direct way of introducing intensional sentence predicates as in $\Diamond(B, t)$. With the method adopted such wff are already available, but their logical interrelations are less specific. The initial assumption of the chronological logic is designed to rectify this deficiency.

Postulate 0 (PO) (i)

$$\text{ext } \Phi^1 \strictif .\ \ \Phi^1(p, t) \strictiff (\Phi^1 p,\ t),$$
$$\text{ext } \Phi^2 \strictif .\ \ (p, t)\ \Phi^2\ (q, t) \strictiff (p\ \Phi^2\ q,\ t); \quad \text{etc.}$$

The assumption, adopted generally for n-place extensional predicate Φ^2, asserts that extensional predicates distribute within @t. It follows, for example, $\vdash \sim(p, t) \mathbin{\&} (q, t) \strictiff (\sim p \mathbin{\&} q, t)$. PO does not extend to intensional sentence predicates as these counterexamples (easily generalised) to an extension show. (Smart believes that 2 + 2 = 4, midnight) is true, but Smart believes that (2 + 2 = 4, midnight) is not true. Consider too the different non-equivalent construals of 'Alcoholism was being discussed at a conference yesterday (in Canberra)', and 'It is possible that John is running when he is not running'. In the case of modalities the (equivalent) implications $(\Diamond p, t) \strictif \Diamond(p, t)$ and $\Box(p, t) \strictif (\Box p, t)$, fail: the converse implications are however correct for consistent times. For $\Diamond(p, t) \strictif \Diamond t$: the general principle $(\Box p, t) \strictif \Box(p, t)$ appears however to conflict with the admission of impossible times, such as the time when a squared the circle. Accordingly only the following qualified postulate is adopted in the case of modalities (the qualification is explained in the discussion of P1)

Postulate 0 (PO) (ii)

$(\pi t).\ (\Box p, t) \strictif \Box(p, t)$, i.e. for all consistent times t, necessarily p at t entails it is necessary that p at t.

Compounding of times by connectives such as 'and' and 'or' cannot be added to the system without some scoping precautions. For example, the definition $(A, t_1 \vee t_2) =_{Df} (A, t_1) \vee (A, t_2)$ would lead to inconsistency: consider alternative expansions of (It was hot and it was wet, Monday $\vee$ Tuesday).

Quantification, neutral quantification, can be based on the (indefinite) description operator ξ, or introduced independently. The time term $\xi t(A, t)$

for example, reads 'a(time) t such that A at t'. The particular quantifier P is connected with ξ by the expected coimplication (a consequence of the extension of the logic), (Pt)(B, t) ⥽ (B, ξt(B, t)), i.e. that, for some time t, B is true at t coimplies that B is the case at a time t such that B at t. The coimplication reveals that descriptions are values of time variables, a fact that is a consequence of the extended ξ-postulate: B(N) ⥽ B(tB), where N is a time expression, i.e. a time variable or a time term, ξt B for some B.

Definite descriptions are defined as in 1.22: thus ιt B $=_{Df}$ ξt(B & (t')(B ⊃. t = t')) i.e. the time such that (of) B is a contingently unique time such that B. Times are extensionally (contingently) identical (or simultaneous) if and only if they share all extensional properties.

Postulate 0 (P0) (iii)

(u)(A, T) ⇆ ((u)A, T), provided u is not free in time term T.

Hence too ⊢ (Pu)(A, T) ⇆ ((Pu)A, T) under the same proviso. P0 (iii) can in fact be asserted for all extensional quantifiers, where a quantifier Q is extensional iff it distributes across an equivalence A ≡ B whenever the universal closure of A ≡ B holds.

Use of neutral (i.e. nonontological) quantifiers eliminates many puzzles; for example the apparently valid argument (considered in Prior 67, p.144) - Nothing that has perished exists, and some house has perished, therefore some house does not exist - is valid when formulated with neutral quantifiers. Similarly "Alexander rode Bucephalus" does entail "Alexander rode something", though it does not entail "Alexander rode an actual horse".

Since logical laws are necessarily true they are true in all possible worlds, and so at all possible times - in this sense independently of time. Thus it would be expected that some principle like J. □A ⥽ (At)(A, t) can be used to link achronological with chronological logics. But J itself is too strong. First, since impossible times are included in the range of quantifiers - because expressions like 'the time at which Hobbes squared the circle' belong to the substitution-range of time variables - J would assert that truths which are necessary are true even at impossible times or in impossible worlds. Impossible times are however just times at which even necessary truths are not all true: to require that they should be true would be to over-restrict the class of impossible times. Secondly, J would lead to inconsistency in a logic which extended the characterisation postulates of chapter 1. Suppose to illustrate the point, the theory includes the truth that it is impossible that Hobbes squared the circle, i.e. abbreviated ~◊h. Now given that the characterisation postulate applies to ξt(h, t) it follows (h, ξt(h, t)), and so also (Pt)(h, t). But using J it follows (Pt)(p, t) ⥽ p, thus:

~◊p ⥽ □~p
⥽ (t)(~p, t) by J.
⥽ ~(Pt)(p, t).

Hence ◊h, and inconsistency.

By weakening J as follows these troubles at least are avoided:

Postulate 1 (P1)

□A ⥽ (πt)(A, t),

i.e. necessarily A entails for all consistent (possible) t, A at t. Possibility-restricted temporal quantifiers 'π' and 'Σ', and consistent times, are explained as follows: t◈ $=_{Df}$ ~(Pp)(~◊p & (p, t)), i.e. a time t is

possible iff no impossible statement is true at t. $\Sigma\ t\ B =_{Df} \xi t(t\Diamond\ \&\ B)$[1], i.e. a consistent time t such that B is a time which is consistent such that B. $(\Sigma t)\ B(t) =_{Df} B(\Sigma t\ B(t))$; $(\pi t)\ B(t) =_{Df} \sim(\Sigma t) \sim B(t)$ A stronger, but less satisfactory, definition of 'Σ' is this: $(\Sigma_1 t)\ B(t) =_{Df} (Pt)(t\Diamond\ \&\ B(t))$. $\vdash (\Sigma_1 t)\ B(t) \rightarrowtail (\Sigma t)\ B(t)$; $\vdash \check{S}^t_N\ t\Diamond\ \&\ B(t)| \rightarrowtail (\Sigma_1 t)\ B(t)$; $\vdash \Box A \rightarrowtail (\pi_1 t)(A, t)$, where $(\pi_1 t)\ B(t) =_{Df} \sim(\Sigma_1 t) \sim B(t)$.
Since times which exist, have existed or will exist are consistent times (see below), it follows using P1, since $\Box(2 + 2 = 4)$, that 2 + 2 = 4 next week as well as at 1000 B.C. But though the general principle $\Box A \rightarrowtail (\pi x)$ A @ x should produce significance qualms since it leads to results such as '2 + 2 = 4 at 10 stone', P1 need not for reasons already given. It follows, using P1,

$\Box A, t\Diamond \mathrel{-\!\!\rhd} (A, t)$, but the weaker rule
$A, t\Diamond \mathrel{-\!\!\rhd} (A, t)$ is incorrect. For applying the rule - given the fact, which we can easily add to the logic, that Bertrand Russell exists - we should wind up with the falsehood that Bertrand Russell existed 1000 years ago. Indeed the EO thesis would be falsified.

Although P1 is true, since necessary truths are true in all possible worlds and each possible time generates a possible world via the statements true at the time, the converse of P1,

$\check{1}$. $(\pi t)(A, t) \rightarrowtail \Box A$

is false. However it is sometimes supposed that $\check{1}$ is true, for instance by theories according to which the past is necessary. Thus Diodorus apparently adopted an account of necessity which implies $\check{1}$. A first counterexample to $\check{1}$ is provided by $(\pi t)((Px)xE, t) \rightarrowtail \Box(Px)xE$. For it is perfectly consistent to assert that at every consistent time some item exists, but that it is not logically necessary that some item exists. Further counterexamples to $\check{1}$ (or better to a version of $\check{1}$ which strengthens the antecedent to all physically realizable times) are got on the false but consistent supposition that consistent times have a last term (or a first term). If consistent time has a last term then $(\pi t)((\Sigma t')(t < t'), t)$, but it is not logically necessary that $(\Sigma t')(t < t')$.

The interpretation of wff has not yet been made sufficiently explicit. Although expressions like ((A, t), t) are well-formed according to the logic, their interpretation is not unambiguously fixed; in particular the interpretation of A and (A, t) should be further clarified. Before the introduction of (A, t) in addition to A, the logic was inadequate to formalise and assess a wide class of sentences and arguments containing temporal expressions, e.g. sentences like 'Whatever is future will be present', 'It is possible that in the future all speech will end and all sentient organisms will die', 'If a person is always happy, he is happy when he ceases to exist'.[1] This is not to say that the nonchronological logic is not interpreted over tensed expressions: it is. Thus both 'Socrates is happy' and 'Socrates was happy' are admissible substitution-instances of xf ; though the subjects of these sentences are the same, the predicates 'is happy' and 'was happy' are different, and 'was happy' is not amenable to further analysis in terms of 'is happy'. Furthermore all the sentences of the (underlying) nonchronological logic are tensed sentences; for they each include a verbal component and every verb carries a tense. That the sentences of the underlying theory are tensed sentences encourages construal of indicative sentences as true iff they are true now. In fact a treatment of this sort is already forced in special cases by the E0 thesis: $xE \leftrightarrow (xE, 0)$. A generalisation of this thesis, adopted by Prior in the intended interpretations of his tense logics, is the next assumption:-

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[1] Should entailment be used in place of necessary material implication the following Σ-postulate seems to be needed (in lieu again of a more satisfactory theory of restricted variables: $\check{S}^t_T\ B| \Rightarrow B(\Sigma t\ B)$, where time term T is consistent. Hence $\vdash (\pi t)(A, t) \Rightarrow \check{S}^t_T\ (A, t)|$, provided $T\Diamond$.

Postulate 2 (P2): $A \leftrightarrow (A, 0)$

where the new primitive '0', read 'now' or 'the now time', is a substitution-value of time variables. Thus, for example, 2 + 2 = 4 coentails 2 + 2 = 4 now. Hence too, $\vdash (\pi t)(A, t) \rightarrow A$, and $\vdash E0$. P2 reflects the tensed present-oriented feature of discourse. It is of course possible to construct different tense logics which are not present-oriented, for example by taking another orientation point, such as last week or 1984 at Plumwood Mountain for such discourse.

The logic is inconsistent with that relational theory of time according to which it is impossible to have time unless something exists at each time. On this relational theory, $(\pi t).\ (p \supset p,\ t) \rightarrow ((Px)xE,\ t)$, since it is not logically possible that t is a time unless something exists at t. Hence

$$\begin{array}{llll}
 & \Box\,(\pi t)(p\quad p,t) & \rightarrow (\pi t)((Px)xE,t) & \\
 & & \rightarrow ((Px)xE,\ 0) & \\
 & & \rightarrow (Px)\ x\ E & \text{by P2} \\
\text{But} & \Box(p \supset p) & \rightarrow (\pi t)(p \supset p,t) & \text{by P1} \\
\text{So} & \Box\Box(p \supset p) & \rightarrow \Box\,(\pi t)(p \supset p,t). &
\end{array}$$

Refuting $\Box(Px)xE$; but this is inconsistent with Meinong's theorem (previously defended and adopted), $\sim\Box(Px)xE$, i.e. it is not logically necessary that something exists. Such relational theories are condemned independently in that they rest on the Reference Theory: otherwise why should some item have to exist at a time in order for a consistent role to be ascribed to that time?

It is a consequence of P2 that statements like "Socrates exists" and "Meinong is happy" - unlike noncontingent statements such as 2 + 2 = 4 - are true at some times and false at others. Though such an outcome accords with the Aristotelian and scholastic account of statements it conflicts with a standard theory of propositions according to which only temporally invariant sentences express propositions (these points are explained in detail in Prior 67). But there is nothing to stop us having both temporally variable statements, such as "Socrates exists (now)", which are true at one time and false at another, and temporally definite statements, like "Socrates exists at 400 B.C."; and the chronological logic, with its temporal qualification, like the universal theory of 1.24, in fact caters for both. A logic which allows both for temporally variable statements and for temporally more definite statements has the immediate advantage of greater generality; it is more comprehensive than logics which only admit temporally definite statements, unless temporally variable statements can be suitably reduced to temporally definite ones. Because of the comprehensiveness of the logic, P2 does not, despite appearances, legislate against temporally definite or nontemporal discourse; such discourse is included within the range of the logic.

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[1] This point is enough to cast serious doubt on the dogma that chronological logics are philosophically unimportant and that there is nothing special about time as a qualifier or quantifier or property. For the dogma see Goodman 77 and Quine WO. The philosophically relevant sections of Prior 67 provide a good base for a case against the dogma.

A first stab at marking out nontemporal discourse is summed up in the following characterisation: A is $\text{nontemporal}_1 =_{Df} A \leftrightarrow (\pi t)(A, t)$. It follows, $\vdash \Box A \rightarrow$ A is nontemporal_1 , $\vdash \sim\Diamond A \rightarrow.$ A is nontemporal_1, and $\vdash \sim$(A is nontemporal_1) $\rightarrow. \nabla A$. Hence "2 + 2 = 4" is a nontemporal statement. But although all statements of logic and mathematics emerge, as desired, as nontemporal, given that they are necessary, it does not follow (what used to be taken as a desideratum) that statements of physical laws are nontemporal. To rectify the matter the notion of physical possibility, symbolised $\langle P\rangle$, needs to be introduced somehow or other. Here it is taken as a primitive modal connective. (Alternatively $\langle P\rangle A$ could be defined, in a familiar if defective[1] way, as 'A is compatible with all physical laws' Then physically realisable times may be defined: $\langle P\rangle t =_{Df} \sim(Pp)(\sim \langle P\rangle p \;\&\; (p, t))$. A similar development to that based on logical possibility '$\Diamond$' is made for '$\langle P\rangle$'. Thus, for example, universal and particular quantifiers 'π_p' and 'Σ_p' are introduced. With this development an improved definition of nontemporality can be provided, namely:- A is nontemporal $=_{Df} A \leftrightarrow (\pi_p t)(A, t)$. Then $\vdash \sim\nabla A \rightarrow.$ A is nontemporal, $\vdash \boxed{P} A \rightarrow.$ A is nontemporal, where $\boxed{P} A =_{Df} \sim\langle P\rangle\sim A$, $\vdash \sim\langle P\rangle \div.$ A is nontemporal. Hence if $\boxed{P}(E = mc^2)$, then "$E = mc^2$" is nontemporal. As an outcome of the definition of nontemporality, nontemporal statements are relatively time-independent; and insofar as they are time independent time can be abstracted from their assertion. Thus nontemporality provides a formal analogue for the widely deployed but ill-explained notion of temporal assertion. The myth of tenseless assertion should however be exploded. The notion of tenseless sentences is one infected with difficulties; for instance, standard examples of tenseless sentences of English are present-tensed and accordingly not tenseless. Nor can this tense be eliminated (even by abstraction feats) because of the tensed character of all English verbs.

Physical and logical non-contingencies do not provide the only cases where temporal qualifications may be omitted and time accordingly abstracted from. A further class is provided by the next assumption:
Postulate 3 (P3): $(\pi t)(A, t) \leftrightarrow A$, provided A is not free for temporal qualification.
P3 does not hold generally under the interpretation adopted; for otherwise $(xE, t) \leftrightarrow xE \leftrightarrow (xE, 0)$, and disaster. A wff A is not free for temporal qualification iff every atomic subwff of A is eventually qualified by a bound time variable. For example $(Pt)(xE, t) \;\&\; (Pt')(p \vee q, t')$ is not free for temporal qualification. Applying P3,
((Pt)(It snows in Melbourne, t), t') $\leftrightarrow$ (Pt)(It snows in Melbourne, t)
$\leftrightarrow$((Pt)(It snows in Melbourne, t), 0).

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[1] See the discussion in A. Bressan, 'On physical possibility and constitutive equations', to appear.

2.4 CONCATENATED TIMES; LOGICAL PROPERTIES OF ⊕

Among the class of time expressions dates can be distinguished. Roughly a date is a temporal specification, not involving a present or egocentric reference point, defined within some (recognised) calendar system, for example within the Christian or Moslem calendars. A calendar provides a time metric oriented on a standard event. Thus 'on July 4, 1968' and 'at the last hour of 1900' are dates, but 'now', '10 years ago' and 'at the time when the dodo disappeared' are not. A predicate expression is dated if it contains a date specification and no temporal qualifiers which are not dates. A sentence is dated if all its predicate-expressions are dated. Aren't dated sentences temporally definite? Though they are not temporally variable, they are very often not as temporally definite as they could be! Consider the successive consistent qualifications indicated in (((The war stopped, in 1958), 10 Jan.), 10 p.m.). This says more than (The war stopped, 1958); it coentails what we can represent thus: (The war stopped in 1958 on Jan. 10 at 10 p.m.) or schematically (The war stopped, 10 p.m. Jan. 10, 1958). Generalising this connection of times leads to
Postulate 4 (P4): $((A, t), t') \leftrightarrow (A, t \oplus t')$.
A new class of time expressions, concatenated times, formed using the new primitive ⊕, has thus been admitted. ⊕ conforms to the formation rule: If t and t' are time expressions then $(t \oplus t')$ is a time expression.

Not all time qualifications are consistent; consider for example "The Blue Nile Falls are dry in 1957 in 1958", and "Socrates died in 399 B.C. 10 years ago". What is consistent is the very different "The Blue Nile Falls are dry in 1957 and 1958", not "The Blue Nile Falls are dry @ (1957 ⊕ 1958)". Concatenation of times is very like addition of times, only for proper addition times must be rationalised and made consistent, for example the same units must be used and the datings made consistent. Without a metric on times the usual recursive axiomatisation of addition cannot be adopted since no units of time are available for the recursion clause. When a uniform metric is imposed ⊕ can serve for addition of metrized time expressions. But even without metrisation a mathematical treatment is available: for
Postulate 5 (P5). Times form a commutative group under ⊕, where the identity determinate is that of extensional identity. Spelling this out is simply a matter of setting down some set of axioms for the group. The closure property already follows from the formation rule for ⊕. So the postulates P5 entails are these:

5.1 $t \oplus 0 = t$ 5.2 $t \oplus t' = t' \oplus t$
5.3 $t \oplus (t' \oplus t'') = (t \oplus t') \oplus t''$
5.4 $(Pt').\ t \oplus t' = 0$

Extensional identity for times is defined in terms of predicates of times thus: $t = t' =_{Df} (U \text{ ext } f)(tf \equiv t'f)$, where extensionality is characterised as before. Finally it is assumed

5.5 ext $(\oplus T)$, for any time term T whose further predicates, if any, are extensional.
The effect of 5.5 is to give the effect of Leibnitz identity for a large class of time terms, including all those needed for proving familiar group properties. It follows, for instance, that $t \oplus t = t$, that the group identity 0 is unique and the only idempotent element of the group, and that each element of the group has a unique inverse. The inverse of t is written, as usual in a module, -t, i.e. $-t =_{Df} \iota t' \quad \oplus t' = 0)$

Admitting inverse elements practically amounts to admitting, as has been done, expressions like '10 years ago' and 'last week' as substitution-values of time variables. So, for example, we have (Russell is happy, 10 years ago), 10 years in the future) $\leftrightarrows$ (Russell is happy, 10 years ago $\oplus$ 10 years hence) $\equiv$ (Russell is happy, 0) In the last step the fact that ext f and ext (f, t) are interderivable is used. The inverse of dates such as 1958 are expressions relating times such as 10 years later; the inverses of dates vary with change of time. Inverses though unique are not unique up to synonymy or even up to strict identity: otherwise 1958 would (in 1968) be strictly identical with 10 years ago.

A temporal precedence relation, earlier than, can be introduced into the theory in various ways. For example, if the notion of positive time from any given origin is introduced precedence can be defined just as the less than relation is defined in Peano arithmetic. A less devious route is simply to introduce the relation <, read 'is earlier than' or 'wholly precedes', as a new primitive satisfying the formation rule:
If t_1 and t_2 are time terms then $(t_1 < t_2)$ is a wff. Temporal precedence, precedence of times, should, it seems, apply initially to times, only derivatively to events and other items that mark times, even though it may eventuate that times are only abstractions from features of these other items. Some times do precede others: 1958 precedes 1959, the time when Brutus killed Caesar precedes the time of Cleopatra's death. But since times other than now do not exist, quantification over times is neutral quantification, and the times that are ordered by < do not in general exist.

In terms of < other ordering relations are defined:

$$t_1 \leqslant t_2 \;=_{Df}\; t_1 < t_2 \vee t_1 = t_2 \;;$$
$$t_1 \sim t_2 \;=_{Df}\; \sim(t_1 < t_2) \;\&\; \sim(t_2 < t_1) \;.$$

< may be compared with Russell's primitive P , ~ with Russell's S (36, 347-8): but the relations differ in their ranges, < being defined on times whereas P is defined over (token) events. The relations can however be extended (given certain assumptions), so that their ranges coincide. For example, given < and an event predicate H, read 'happens', P can be introduced thus:

$$e_1 \, P \, e_2 \leftrightarrows (e_1 H, t_1) \;\&\; (e_2 H, t_2) \;\&\; t_1 < t_2,$$

i.e. that event e_1 precedes event e_2 coentails that e_1 happens at t_1, and e_2 happens at t_2 and t_1 precedes t_2.
Relation ~ reads, like Russell's S, 'temporally overlaps' or 'is partially simultaneous with' or 'is not temporally connected with'. Much as in Russell (36, p.348), further relations may be defined; e.g.

$$t_1 \sim\!/\!< t_2 \;=_{Df}\; (Pt)\;(t_1 \sim t \;\&\; t < t_2),$$
$$t_1 \sim\!/\!\nless t_2 \;=_{Df}\; (Pt)\;(t_1 \sim t \;\&\; t_2 < t).$$

Russell in effect adopts the Newtonian reading 't_1 begins before t_2' for $t_1 \sim\!/\!< t_2$; relativistically this reading is inadequate. Further Russell's assumption (36, p.348) that ~/< is transitive, though correct for absolute and proper time, appears to fail for relativistic time. Accordingly only a weaker relativistically admissible assumption is made.
Postulate 6 (P6). < is an extensional partial ordering on times, i.e. < is a transitive and irreflexive relation on times, and ext (<) [i.e. ext_1 (<t) and ext_2 (t<)] for all time terms t which contain no non-extensional predicates. It follows at once that < is an asymmetrical relation on times; and also $\vdash$ Reflex ($\leq$). It also follows, as is proved:-

$\vdash$ Trans ($\leq$)

Proof: $t_1 \leq t_2 \;\&\; t_2 \leq t_3 \;⥽.\; (t_1 < t_2 \vee t_1 = t_2) \;\&\; (t_2 < t_3 \vee t_2 = t_3)$
$⥽.\; (t_1 < t_2 \;\&\; t_2 < t_3) \vee (t_1 < t_2 \;\&\; t_2 = t_3) \vee (t_1 = t_2 \;\&\; t_2 < t_3) \vee (t_1 = t_2 \;\&\; t_2 = t_3)$
$⥽.\; t_1 < t_3 \vee t_1 < t_3 \vee t_1 < t_3 \vee t_1 = t_3$
$⥽.\; t_1 \leq t_3.$

$\vdash t_1 \leq t_2 \;\&\; t_2 \leq t_1 \;⥼⥽.\; t_1 = t_2$

Proof: $t_1 = t_2 ⥽ t_1 \leq t_2 \;\&\; t_2 \leq t_1$. Also,
$t_1 \leq t_2 \;\&\; t_2 \leq t_1 \;⥽.\; (t_1 < t_2 \;\&\; t_2 < t_1) \vee (t_1 = t_2 \;\&\; t_2 < t_1) \vee (t_1 < t_2 \;\&\; t_1 = t_2) \vee (t_1 = t_2 \;\&\; t_1 = t_2)$
$⥽.\; t_1 = t_2 \vee t_1 < t_1$
$⥽.\; t_1 = t_2$, since Irreflex (<)

$\vdash t_1 = t_2 \;⥽.\; t_1 \sim t_2$

Proof: $t_1 < t_2 ⥽ \sim (t_1 = t_2)$,
since $t_1 < t_2 \;\&\; \sim (t_1 < t_1) \;⥽.\; (\mathrm{Pext}\ f)\ (t_1\ f \;\&\; \sim t_2\ f)$.
Hence $t_1 < t_2 \vee t_2 < t_1 ⥽ \sim (t_1 = t_2)$.

That the converse $t_1 \sim t_2 ⥽ t_1 = t_2$ does not hold generally is an important feature of relativity theory. Equally important the relation ~ is not transitive, despite Trans (=). The relation ~ behaves logically like the spacelike separation relation of relativity. Not only is it not generally transitive : also $\vdash$ Reflex (~) and $\vdash$ Sym(~) , just as for the spacelike separation relation of relativity. There seems no crushing objection, when elaborating the theory, to identifying (contingently) ~ with the spacelike separation relation of relativity theory. Given such a connexion, absoluteness of time (in one important sense) can be defined:

$$\text{Time is absolute} =_{\mathrm{Df}} (\pi_p t_1\ ,\ t_2)(t_1 \sim t_2 ⥽ t_1 = t_2).$$

Familiar presentations of relativity theory, which adopt ~ as the simultaneity relation, are definitely misleading. For a simultaneity relation is a sameness-of-time relation, and hence an identity relation; and the transitivity of an identity relation is a logical feature of such a relation. Thus, as a matter of logic, the relation ~ is not an identity relation, and therefore not a simultaneity relation. Contrary to Grünbaum (64, p.351) then, this usage restriction is not simply an ordinary language requirement, and its retention has nothing to do with retention of Newtonian beliefs.

In order to obtain usual tense distinctions terrestrial proper time (or an analogue) should be introduced, for example through a further time ordering relation $\lessdot$.

P6' : $\lessdot$ is a connected extensional partial ordering which coincides with < for the cases where $t_1 < t_2$ holds (i.e. $t_1 < t_2 ⥽ t_1 \lessdot t_2$).

In the preliminary discussion of tenses which follows, however, the distinction between $\lessdot$ and < is neglected: terrestial tenses, as distinct from universal tenses relative to 0 , are obtained by replacing < by $\lessdot$. Tenses other than the present are reduced to the present tense of the logic using

Prior's tense logic functors (for details of this reduction of tenses see 67; the feasibility of such a reduction has long been realised). Prior's connectives are defined as follows:

$$P\,A =_{Df} (Pt)\ (t < 0\ \&\ (A,t)),$$

i.e. it has been the case that A iff for some time earlier than now A is the case at t.

$$\begin{aligned} H\,A &= (t)\ (t < 0 \supset (A,\ t))\ \&\ (Pt)\ (t < 0) \\ F\,A &= (Pt)\ (0 < t\ \&\ (A,\ t)) \\ G\,A &= (t)\ (0 < t \supset (A,\ t))\ \&\ (Pt)\ (0 < t). \end{aligned}$$

H, F and G read respectively 'It has always been the case that', 'it will be the case that' and 'it will always be the case that'. This representation of Prior's connectives is not perfect, as regards the recovery of postulates of (basic) tense logic, but suffers from the same sort of defects as the syntactical representation in classical quantification logic of traditional syllogistic (discussed in 1.16). Thus for instance, the particular clauses tacked on to the definitions of H and G to ensure that $\vdash$ HA ⥽ PA and $\vdash$ GA ⥽ FA, parallelling tacking clauses to resolve problems of existential import in representing the syllogism. Once again (as in 1.16) given a superior analysis of 'such that' and restricted variables to the classical extensional analysis, an improved syntactical representation could be provided (and therewith strict implication, which ties with the extensional analysis, superseded by entailment[1]). Alternatively, by switching to a semantical representation, imperfections of fit can be removed, in a rather classical way. Adequate extensional modellings can be given for all the main tense logics, with quantificational-style representation (like that of modal functors in 1.17) of Prior's functors in terms of quantification over possible worlds or times. The perfection of fit is achieved however by the imposition of semantical modelling conditions, which serve as semantical postulates to bridge gaps. There is with the quantificational-relational representation of tenses and Prior's functors, as in the case of context (discussed in Slog 7.2), the question of whether representation should be overtly syntactical or remain semantical. The guidance of discourse is clear enough however : an adequate theory of time should include in its syntax (as primitive or derived) both Prior's functors and tenses and also the representational apparatus, interrelations and orderings of and quantifications over times.

Once past, present and future times and the existence of times are characterised many results on McTaggart's A-series (the series: past, present, future) follow:-
t is present @ t $=_{Df}$ t = t ; $\vdash$ t is present ⥼⥽ t = 0;
the present $=_{Df}$ $\iota t\ (t = 0)$; t is past @ t' $=_{Df}$ t < t';
the past $=_{Df}$ $\hat{t}\ (t < 0)$; t is future @ t' $=_{Df}$ t' < t;
the future $=_{Df}$ $\hat{t}\ (0 < t)$;
x is a present entity @ t $=_{Df}$ (x E,t); $\vdash$ x is a present entity ⥼⥽ x E;
x is a past entity @ t $=_{Df}$ (Pt')(t' < t & (xE, t'));
x is a future entity @ t $=_{Df}$ (Pt') (t < t' & (xE, t'));
$\vdash$ x is a future entity ⥼⥽ x will exist; $\vdash$ Future things are things that will exist.

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[1] One of the main factors preventing immediate retooling with relevant connections concerns the loss of expected inferential power when restricted variables are analysed classically.

$\vdash$ x is a present entity $\leftrightarrow$ entity x was future & is present & will be past.

Re-expressions of Findlay's theses (presented in Gale 67, p.160) likewise follow; namely:
$\vdash$ x is present $\leftrightarrow$ x is present at (the) present;
$\vdash$ x is future $\leftrightarrow$ x is future at present; etc.

A definition of the existence of times can be based on the pervading thesis, existence is existence now; namely

$t\ E =_{Df}\ t = \iota t(t = 0)$. Then,
$\vdash \iota t\ (t = 0)\ E$, i.e. the present exists.
$\vdash\ 0 = \iota t\ (t = 0)$ i.e. Now = the present.

Proof: Since $\iota t\ (t = 0)\ E$, $\iota t\ (t = 0)$ is reliable by the ECP.
$\vdash\ t\ E =.\ t = 0$; $\vdash\ 0\ E$.
$\vdash$ Past times do not exist; $\vdash$ the past does not exist. $\vdash$ Past times have existed, i.e. (Ut)(t is past $\supset$ t has existed) $\vdash$ Future times do not exist; the future does not exist. $\vdash$ Whatever is a past entity has existed.
$\vdash$ The past & future do not exist, now: nor do they exist timelessly.
$\vdash$ The past has existed but does not now: in _this_ sense the past is not real. $\vdash$ The future will exist but does not yet: it too is not real in _this_ sense. To say that the past is unreal is not of course to say that history is mythology or bunk or that the past is prefabricated[1]; for past times have existed. But though each past time has existed, at no time does or has the past existed.

But definition of tE or not, there is a real question as to whether any such objects as times, time instances, time slices, even present times, exist. For times do not have, at least in a straightforward way, locations - unless we say, very artificially, that they are everywhere, or, relativistically, everywhere in the local fuzzily-bounded region. Nor do they have entire physical relations, e.g. they cannot (significantly) be hit, caused, irradiated, etc. Thus time instances appear to fail tests for existence; they appear to fail the unified criteria for existence subsequently adduced (in chapter 9); they appear not to exist.

Whether Time itself exists depends - once the Ontological Assumption is got past - on many things, especially, given that Time is a universal, is a property of times, on the criterion of property existence assumed. If an instantial criterion were adopted then Time would exist, assuming further that the present (instance) exists. However, if a different criterion is preferred, according to which such universals as properties do not exist - a criterion ultimately demanded by the indeterminacy of properties should properties be objects of a sort - then Time does not exist. Subsequent arguments (given in chapter 9) will lead to just such a conclusion: that Time does not exist. Again that does _not_ imply that it is a fabrication or fiction; that things don't genuinely happen at different times, that some things do not happen after others, that none are truly past, that nothing will happen, that some things do not exist now, etc.

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[1] History and the past are genuine enough. And history has many interesting features yet to be touched upon, e.g. the intensionality of so much of it, especially the theoretical elements (see chapter 10).

2.4 EXPRESSIVE POWER OF THE LOGIC

The logic so far elaborated caters for the symbolisation of sentences, which reveal the breakdown of Smart's theory of tense elimination (of 63, p.134), and for the formalization of valid arguments which Smart's theory excludes. Consider for example "Some entity was future and is present and will be past" which indeed entails "Some entity is present"; or (after Prior 67, p.12) 'Eventually all speech will have come to an end', or 'At some future time everything actual will have ceased to exist'. Indeed the logic permits the formalisation of many sentences, about nonentities and what will not exist, which Prior's theory (in 57 and 67) so far provides no way of formalising.

A cross-classification of times is provided by the following inclusive series: times, possible times, physically realisable times, sometimes actual times, historical times, and now. Sometime actual times are tentatively defined thus: $t\ SE =_{Df} (tE, t)$, and historical times are defined as past or present sometimes actual times. It is tempting, but probably a mistake, to introduce a bridging assumption, namely,

$(t\ E, t) \rightarrow t \Diamond\!\!\!\!\!\;P$;

from which it will follow that times that exist, have existed or will exist are consistent times. Even if the result is right, the route is doubtful.

An extension of the preliminary definition of item existence also follows, namely $\vdash (x\ E, t) \leftrightarrow (U\ ext\ f)\ ((x \sim f, t) \equiv \sim (x\ f, t))$. This characterisation of existence at time t provides a basis for accounts already sketched (in §3) of becoming and ceasing to exist. Then too sometime-existence - often misleadingly called atemporal or tenseless existence - can be defined: $x\underline{E} =_{Df} (Pt)\ (x\ E, t)$. Remember that sometime-existence is not strictly a kind of existence.

If 0 can be defined within the logic the A-series of McTaggart can be reduced to the B-series (of earlier and later than relations) together with the tensings of the logic. A promising way of defining 0, as suggested by the E0 thesis and P2, is in terms of the present tense. A present tensed expression available in the theory is $(P\ x)\ x\ E$, & hence an initially promising definition is simply $0 =_{Df} \iota t\ (P\ x)\ x\ E$: the definition uses a vacuous iota term. An alternative definition, based on the nonexistence is nonexistence now thesis, which avoids difficulties about times, if any, when nothing exists, is this: $0 =_{Df} \iota t\ (P\ x) \sim x\ E$.

Objections are bound to be raised to the introduction of Now into the logic - objections which are independent of the adequacy of the proposed definitions or others. A first objection is that it destroys the purely topological approach to time by introduction of an origin. If P2 and the definition of 0 are abandoned then a topological "chronological" theory remains. But many of the distinctive features of time, as distinct from space say, are lost. And without P2 the interpretation of the logic is obscured. Moreover the topological approach is not just inadequate for the treatment of existence, since existence is existence now, of other scientifically relevant properties, and of anisotropy; it also excludes the treatment of tenses and of McTaggart's A-series and its features. In sum, the strictly topological approach is simply inadequate to the subject matter.

A second objection, based on the theory of relativity, is that the theory 'does not make any allowance for the transient Now of common sense' (Grünbaum 64, p.318). So far this only indicates - as observed by Reichenbach (see also 64, p.318) - the incompleteness of the 4-dimensional picture used by the theory of relativity: it simply omits treatment of A-series features. To reinforce the objection very sweeping (but no doubt false and certainly anthropocentric) claims are sometimes made, such as that the concept of Now cannot be assigned a legitimate place in physics, and is not part of physics, but that Now is a purely psychological mode introduced by man (see, e.g., Bergmann, and Grünbaum, as in 64, pp.323-4). According to Grünbaum (p.324),

> the coming into being or becoming of an event, as distinct from its merely being, is thus no more than the entry of its effect(s) into the immediate awareness of a sentient organism (man);

and he attributes to Weyl his own thesis that coming into being, happening, as contrasted with being (that is existence: 64, p.324), is only coming into the present awareness of a sentient organism.

None of these dogmas are consequences of the theory of relativity at all, in particular the platonic claim about existence. For the theory of relativity can, and should, be formulated using nonexistential quantifiers. It can be so formulated because formalisations of (fragments of) the theory using existential quantifiers can be replaced by formalisations using nonexistential quantifiers; it should be so formulated because what exists is not relativistically invariant (see also below), and because much of which the theory of relativity speaks (especially when applied) does not exist. Since, furthermore, becoming and coming into existence can be defined in a quite nonpsychological way using 'O', the remaining issue comes down to the question of the correctness of the following thesis:

(Q). Now is a psychological mode which has no legitimate place in physics.

But Q is false. O has been defined without appeal to psychological matters. McTaggart's A-series would not somehow vanish with the extermination of all sentient beings. For now is the time at which something fails to exist, or exists; and what exists, or does not, is not a psychological, or anthropocentric, matter. Also, as Black has emphasised (see Grünbaum 64, p.327), the concepts of McTaggart's A-series and of change are inseparable components of the commonsense and initial scientific outlook, and are a standard part of scientists' laboratory concepts. What, then, is case for Q? Part of the case is built on verification principles; for example, the only way one can verify features of Now is by my own experience and awareness. This is clearly a poor argument, quite apart from the well-known deficiencies of verification principles: because this is, in the relevant sense, the only way one can verify any empirical matter whether of physics or elsewhere.

Similarly objectionable is the connected claim (Grünbaum 64, p.325), that 'the instantaneous awareness of succession ... is an essential ingredient of the meaning of 'now'.' But reflection on the sense of 'now', reinforced by consultation of dictionaries, does little or nothing to support this deliberate attempt to psychologize the meaning of 'now'. Awareness, by some conscious item, is not entailed by the sense of 'now'. Moreover objections to the old idea that Now marks out an instant of time, as distinct from a neighbourhood, are nowadays well known (instants of time themselves are suspect in some quarters, because as ideal limits or infinitesimals they do not exist).

A further common argument for Q is this:- Now cannot be defined absolutely because, given relativity theory, the notion of absolute simultaneity cannot be introduced in a convention-free way. This does nothing to show that Now is a psychological matter - relativity theory does not show that space is a psychological matter - but it may be thought that it supports the thesis that Now has no legitimate place in physics. It doesn't, because many notions which are not relativistically invariant and are not entirely "convention-free" have legitimate places in physics. This undermines the first part of Grünbaum's argument, namely

1. Any definition of 'now' which makes use of absolute simultaneity is inadmissable. For it is only inadmissable if the notion defined is supposed also to be invariant. If, however, we define 'now' in our usual terrestial framework, why shouldn't we then, if we want to, introduce "absolute" simultaneity, even if it rests on an assumption which is alleged to be, as a matter of physical necessity, untestable? And even if it depends on a local framework?

2. Any definition of 'now' in terms of the class of events not causally or signal connectible with a particular (Here-) Now 'yields a conception of the present which differs from the Now of conscious experience' essentially (64, p.319). For 'a given event E_2 at point P_2 in space will remain simultaneous for an observer at a distint point P_1 throughout a continuum of events having a spacelike separation from E_2'. On the contrary, similar features are already involved in everyday and scientific discourse about the present. It is perfectly satisfactory to talk of Now, referring to today or to this year; in such cases a continuum of events is included given real number metrisation of time intervals. Moreover the velocity of light is so great that few discrepancies with ordinary usage occur over terrestial distances.

If, however, the Now "of conscious experience" is extrapolated to apply to astronomical distances and to allow for really high-speed travel, then discrepancies will appear. Then, given the received theory, differences between O defined in the logic and 'now' as defined in 2 have to be recognised. The unsubscripted O is defined for our standard terrestial system. O_S for a system S moving at a high relative velocity, may coincide terrestially with O but differ from O at astronomical distances. Not only is Now system relative; given relativity, what really exists is likewise system relative. A computerised mechanical system passing the earth at a high velocity may report that a star, which still exists according to terrestial astronomers, has ceased to exist. There are discrepancies not just over what exists; there may be differences over a wide range of extensional properties, for example what colour a distant star is, how old and how heavy a man is (compare the clock paradox), and so on. Because of discrepancies over what exists, the predicate 'E' and likewise normal existential quantifiers have to be system relativized, given the theory of relativity: the unsubscripted ones adopted have been those of the terrestial framework. Because of the system relativity of existential quantifiers, neutral quantifiers are important for the formulation of the invariants of relativity theory. For quantifiers of the form 'There exists timelessly...' are excluded through the EO thesis and because of the total unsatisfactoriness of the notion of timeless existence; and quantifiers of the form 'There exist sometimes...' and 'There exist always...', which can be freed from a particular system, are either not adequate to the task or else unnecessarily platonize the theory of relativity. But reconstructions of the confused classical notion of timeless existence may, of course, be fitted into the theory; for example $(\underline{\exists}\, x)\, x\, f =_{Df} (Pt)(Px)\, (xE \,\&\, x\, f, t)$. $(\underline{\exists}\, x)\, x\, f$ reads 'there sometimes exists an x which is f'. Then $\vdash (\underline{\exists}\, x)\, x\, f \leftrightarrow ((\underline{\exists}\, x)\, x\, f, t)$, i.e. $(\underline{\exists}\, x)\, x\, f$ is independent of time.

The foregoing criticisms of timeless and tenseless expression and existence are bound to encounter heavy opposition. For it is often assumed that tense can be eliminated by 'paraphrasing tensed sentences into terms of eternal relations of things to times' (Quine, WO, p.172). The same assumption underlies the widespread view that ordinary language tensed discourse can be equivalently represented tenselessly in terms of the Minkowski 4-dimensional representation of space-time (see, e.g., in Gale 67, both Williams and Smart). However these assumptions depend on the correctness of the following transformation

T. (x, t) f = (xf, t), i.e. x at t has f iff x has f at t, where (x, t) is a stage or time-slice.

One of the more explicit attempts to so eliminate tenses appears in Quine's work, and in his sample eliminations the transformation T is repeatedly applied (see, e.g., WO, pp.172-4); for example 'x is eating y at a' transforms to 'x at a is eating y'. The same transformation is applied in linking individuals with their stages or time-slice; for example, a Cäyster-stage connects with the Cäyster river as illustrated by the following application of T : "The Cäyster (flooded the lower Cäyster valley) @ the first day of the year 400 BC" is equivalent to "The Cäyster @ the first day of the year 400 BC (flooded the lower Cäyster valley)." (For background see the introduction of stages, LP, p.65 ff,). On Smart's projected elimination, a further element is added to T. Smart, a strong advocate of 4-dimensional tenseless discourse, claims that the temporal facts that are ordinarily represented through tensed discourse can be represented within a 4-dimensional (Minkowski) representation (in Gale 67, pp.164-5). This thesis requires at least a truth-functional equivalence between ordinary tensed statements and non-temporal 4-dimensional statements; for otherwise facts would not be preserved under change of representation. If only truth is preserved the transformation will fail for sentences within the scope of intensional functors; and it does then fail as simple examples using functors like 'Strawson believes that ...' reveal. But, apart from this, how is the truth-functional equivalence between the alternative representations established? It hasn't been established: as so often we are expected to rely on a few sketchy examples. Smart re-expresses the sentences 'The spherical cricket-ball becomes ellipsoidal' in the 4-dimensional representation by saying that the 3-dimensional cross-section of cricket-ball$_4$ at $t = t_1$ is spherical and that the 3-dimensional cross-section at $t = t_2$ is ellipsoidal. How is the equivalence shown? By inserting, it appears, the following connections: The spherical cricket-ball becomes ellipsoidal ≡ the cricket ball is spherical and becomes ellipsoidal ≡ for some times t_1 and t_2, t_1 is earlier than t_2 and the cricket ball is spherical at t_1 and the cricket ball is ellipsoidal at t_2 ≡ for some times t_1 and t_2, t_1 is earlier than t_2 and the cricket ball at t_1 is spherical and the cricket ball at t_2 is ellipsoidal ≡ for some times t_1 and t_2, t_1 is earlier than t_2 and the 3-dimensional cross-section of cricket-ball$_4$ at t_1 is spherical and the 3-dimensional cross-section of cricket ball$_4$ at t_2 is ellipsoidal. Smart's theory, then, applies both T and the further identity:

A. x @ t = the 3-dimensional cross-section for t of x_4, where x_4 is a certain 4-dimensional item.

Thus Smart's theory adds to Quine's account of tense elimination a further important ingredient, that generalised in A which links tense elimination with the 4-dimensional picture. But Minkowski's geometric representation of the Lorentz transformations, e.g. as rotations, which is not in dispute, should be distinguished from the general Minkowski representation, which is intended to provide an alternative representation of tensed discourse. It is the general representation that Smart, Williams and others recommend (see Gale 67).

Because T and its immediate improvements are false and A raises serious difficulties, the attempted elimination of tense fails, and the general Minkowski representation is defective. Counterexamples to T abound. First T breaks down for intensional predicates : compare 'It is necessary that John is running when he is running' with 'When he is running it is necessary that John is running', 'Alcoholism was discussed in Canberra yesterday' with 'Alcoholism yesterday was discussed in Canberra', 'The number 2 was thought of at 10 o'clock this morning' with 'The number 2 at 10 o'clock this morning was thought of', 'Aristotle was portrayed (visualised) as a young man yesterday' with 'Aristotle yesterday was portrayed (visualised) as a young man'. To the objection that expressions have not been put into proper logical form before T is applied - for example 'by some people' should be inserted in the alcoholism example, and this insertion should bear the temporal qualification - it should be said: no recipe is given as to what are the appropriate starting logical forms or as to how, or onto which individual expression, the temporal qualification is transferred, and until all this is done, tense elimination using T is just not general and not effective. To the objection that T only holds for extensional predicates it should be replied that the eliminations and re-representations have been put up quite generally and accordingly fail if they fail anywhere; moreover, as some succeeding counterexamples will show T does not hold generally for extensional predicates. Second, T fails for various dispositional, state and performative properties and more generally for long-term properties: consider transformations of 'Jack refused (promised) to sleep on Friday', 'Jack only eats fish on Fridays', 'Joan was married at 10am sharp on Wednesday' (it wasn't the stage of Joan that got married: it was Joan), 'The widow of the former prime minister married on Saturday', 'John walked down the street at about 10 o'clock'. Third, T breaks down in the following sorts of cases: for certain relations of stages - thus Quine today is older than Quine last year, but it is false that last year Quine is older than Quine - and for the predicates 'is (not) a time slice (stage)'[1]. It may be contended that only a principle weaker than T is wanted for tense elimination, for example

T'. Every temporally qualified or tensed sentence can be transformed to a form (x f, t) such that T then holds.

So, for example, 'Jack promised to sleep on Friday' is first replaced by 'Jack promised that Jack sleep on Friday' and then, using T, by 'Jack promised that Jack on Friday sleep'. A still weaker principle may be proposed, such as

T". For every tensed sentence there is an equivalent untensed sentence.

But T" only restates the tense elimination thesis, without giving any of the details that make the thesis good. Nor has T' been made good generally: worse, as it stands it is non-effective.

Several of the counterexamples to T destroy T' as well, in particular examples which employ intensional and long-term predicates, but also examples such as 'Smart is not a time slice at 10 a.m. May 24, 1968'. The claim made is not that it is impossible to eliminate tense: in a weak sense the theory so far developed (like Reichanbach's original theory) eliminates tenses - other than the present. What is contended is that it is impossible to eliminate tensed temporal qualifications of sentences in favour of equivalent sentences stating tenseless properties and relations of stages or time slices, in favour of timeless features of slices. The reason for this is the same as the main reason for the failure of T'. For the elimination of tenses it is essential that stages have all their properties at the one time. For in order that stages or slices be the medium for the elimination of tenses all their predicates must be present tensed, so that they can be reconstrued as tenseless. Hence the stages or slices required for the elimination can have no past or future properties and no properties stretching over time or held at different times. Since, however, it is not true of individual objects, even at a momentary time, that their properties are all held at one time, at the momentary time, the proposed elimination and T and T' must fail. Most of the counter examples are based on this very feature: that objects considered at a time have various properties that stretch beyond that time. The feature suggests further counter examples, using for example identity and continuity. The same feature explains why the tense elimination project strikes serious difficulties with doubly temporally qualified sentences such as 'The New Zealander who climbed Everest in 1952 is alive (is in Nepal) in 1968'; for the 1952 time-slice of Hilary does not have 1968-properties. The 1952 Hilary slice cannot be identified with the 1968 Hilary slice, given the slices required for tense elimination. Nor can resort be made to the persisting item, Hilary, to save the day; for the persisting Hilary reintroduces a heap of tensed predicates and lets back temporal qualification.

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[1] These particular counterexamples were suggested by M.K. Rennie.

At such a point appeal may be made to the 4-dimensional Hilary$_4$, to glue the different time slices timelessly together. However theory-saving 4-dimensional items such as cricket-ball$_4$ and Aristotle$_4$ create difficulties quite as acute as those raised by the timeless Aristotle. For what properties does cricket-ball$_4$ have? How is cricket-ball$_4$ related to the cricket ball? Smarts writes (in Gale 67, p.164) 'Let 'cricket-ball$_4$' be the expression which in our 4-dimensional representation refers to the cricket-ball through its entire history'. But on this account one would expect cricket-ball$_4$ to have all the properties that the cricket ball has at each stage of its history. Then it would be an impossibilium, unless the universe is Parmenidean and never changes: otherwise cricket ball$_4$ is both spherical and not spherical, both has and lacks change properties, and so on. Perhaps instead cricket-ball$_4$, like the average cricket-ball, has at least the properties the cricket-ball always has, for these properties the cricket-ball has through its entire history. But whereas the cricket-ball is always a cricket ball and always 3-dimensional, cricket-ball$_4$ has a shape like a distorted 4-dimensional cylinder and is accordingly neither a cricket-ball nor 3-dimensional. It would be ludicrous to suppose that cricket-ball$_4$ be bowled, in the way the cricket ball always may, or have anything much to do with a cricket-match. Nor does cricket-ball$_4$ have the common properties of its cross-sections; for cricket-ball$_4$ is not a slice or cross-section. Smart's explanation of cricket-ball$_4$ is defective. How, to take another example, does 'Aristotle$_4$' refer to Aristotle through his entire history? Some features of cricket-ball$_4$ are almost as obscure as those of cricket ball noumenon. The sole properties of cricket-ball$_4$ appear to be its space-time location (worm), which may intersect with the space-time locations of other 4-dimensional items, and that it has temporal cross-sections which coincide with instantaneous (localised) stages of the persisting cricket-ball from which it is constructed.

Otherwise however cricket-ball$_4$ is radically indeterminate: hence it does not exist, and should not be existentially quantified over. As to the indeterminacy, cricket-ball$_4$ neither stays the same nor fails to stay the same by changing, is neither hard nor lacking in hardness, is neither red nor some other colour; for it has no tensed properties. It follows that cricket-ball$_4$ is not an entity. Because they connect only with instantaneous stages of the persisting objects on which they are based, 4-dimensional items provide no reflection of intensional, dispositional and long-term properties of the persisting items they are supposed to replace. Thus it is just not true that one can switch over to 4-dimensional discourse without heavy loss: how does one re-express dispositionals such as that H used to be an alcoholic and a smoker and is becoming an alcoholic again, or counterfactuals; and statements about nonentities must, like so much else, be simply written off. Finally, because of its featurelessness, cricket-ball$_4$ fails its appointed job as *independent* amalgam of stages or cross-sections; for how do we decide from which stages to manufacture the fictitious cricket-ball$_4$: only by appeal back to the persisting object, the ordinary cricket-ball, which has these stages. Thus tense-elimination, if it is to avoid circularity, will have to be accomplished without appeal to 4-dimensional items. The unsatisfactoriness of cricket-ball$_4$ and Hilary$_4$ transfers of course to the principle A.

Despite the troubles of time-slice and stages a distinct but related notion, that of *item-sections*, is important for characterizing identity of items over time, and for treating everyday sentences such as 'Albert last year ran faster than John now does' and 'Russell in 1920 still thought atomism was correct'. The 1928-section of Russell, henceforth symbolised '(Russell, 1928)' and read 'Russell of (in) 1928', is understood as a section of the persisting object Russell, as an individual at a time, not as a slice of Russell which begins and ends with 1928. The 1928 slice of Russell is more like Russell just at 1928, and better symbolised (Russell 1 1928), Russell restricted to 1928; for it is restricted to 1928 property-wise. The Δt time-slice of x is that item (x 1 Δt) which has all and only the *present* properties that x has during interval Δt. Time-slice items do not exist because they are indeterminate with respect to times outside their time base Δt. Quine's stages are momentary time slices, i.e. time slices where Δt is momentary. Different time slices or stages of Russell are different items; for example (Russell 1 1928) is quite distinct from (Russell 1 1940-1950). But sections may be identified; for instance (Russell, 1928) = (Russell, 1948).

Persisting or stable items are among the (object-) values of item variables; it is normally sections of these stable items that are identified. Things, not slices and slice abstractions such as sense data and stages provide the interpretational backdrop of the logic. The piecing together of slice items to obtain stable individuals, without somehow smuggling in stable individuals, raises insuperable difficulties. Introduction of sections, as distinct from slices, avoids these problems; for the properties of temporally distinct sections may coincide.

The logic is extended by adding section couples of the form (x, t) satisfying the formation rule: if x is an item term and t a time term, then (x, t) is an item (section) term, and meeting the postulate

P7: (x f, t) = (x, t) f, provided ext f.

Thus a section has at *least* the extensional properties that the item, of which the section is made, has at that time. Individuals may be viewed as special cases of sections, for example as sections over their own life-span; thus (Russe-l is not a section, 1928) is false, so disposing of certain counterexamples. Sections, unlike slices, have past, future and long-term properties. (Russell, 1928) has the property of being a future octogenarian, of being prepared to go on philosophizing, and of having been born many years before. Sections, unlike stages, have all tensed predicates; consequently they do not provide a device for eliminating tense. Sections do not eliminate individuals; they are individuals considered at a time. Sections have a history and a future; slices do not. Yet in spite of the differences the confusion between sections and slices is central to the tense elimination enterprise. For sections T holds for a large class of predicates just because sections are items at a time and have properties beyond that time. Yet just because they have these features which guarantee T, they fail to provide a medium for tense eliminations. In contrast slices, through their abstraction from non-present tensed properties, do provide a medium for elimination; but because of their depletion of properties T frequently fails. It is easy then to see how a conflation of sections and slices would make the tense elimination enterprise seem plausible; and through this confusion the enterprise has gained plausibility.

The solution offered to the problem of identity over time depends on considering sections, not slices. Temporally distinct slices are never identical. But sections are identical iff they coincide on all extensional dated properties. To illustrate: the man of 1968 has changed from the boy of 1958, because the man of 1968 has the undated property of being 6 feet tall but the boy of 1958 does not have this property. However both sections have the dated properties of being about 5 feet tall in 1958 and being 6 feet tall in 1968.

In rounding out the solution the theory stands in need of a fuller account of dated predicates than that suggested earlier or those indications to be found in the literature. Although the distinction has a good intuitive base, it is not sufficiently sharply drawn. There are other important respects in which the theory remains sketchy or unsatisfactory: the formalism is incomplete in ways that matter, no semantical theory is developed (other than the universal one, which is not applied), etc. In short, much remains to be done in working out noneist chronological logic.

Even so, the noneist theory developed, sketchy though it is, has a number of corollaries, not so far elaborated or not so far adumbrated at all, for the philosophy of time. Such an account applies both to entities and to non-entities. For nonentities like entities may change. Orlando and Macbeth both changed over time. Change is not confined to $d(\underline{G})$ but is a feature of many objects in $d(\underline{T})-d(\underline{G})$. Nor are change and time restricted to the (evolving) factual world $\underline{T}$; other worlds may change over time, some other worlds are Newtonian, and so on. Such facts have an important bearing not only on philosophical problems concerning time, but also on the conceptual foundations of physical theories, especially relativity where several of the underlying verificationist assumptions require semantical overhaul.

§5. *Further corollaries of noneism for the philosophy of time.* Noneism casts a new and different light on many of the perennial problems in the philosophy of time, and on some of the newer problems thrown up by modern physics as well. Almost all the "problems", if not directly generated by the Reference Theory, are influenced and distorted by it; and so are resolved or seen differently with its removal. For example, several problems in the philosophy of time arise from a steadfast referential resistance to consideration of alternative worlds, e.g. problems of the connection of time with change, problems of fatalism and determinism. Only a selection from among the problems to which noneism can be profitably applied are considered in what follows.

1. Reality questions: the reality of time? Even if reality is taken (as the OED takes it) to be the property of being real, 'real' itself has several different roles, e.g. what is real may be (actually) existing or occurring in fact or objective (in some sense) or genuine or natural or sincere or not hypothetical or not pretended or ... .[1] It makes a big difference which role is intended. For example, though time does not exist it is genuine (not a pretence or human construction) and objective (as opposed to being a subjective, e.g. a mental feature of subjects of certain sorts, or a property of observers) and natural (not artificial) - so at least it will be maintained. When philosophers assert or deny or argue about the reality of time or of the future, they are usually, but not always, exercised about the existence issue. Let us consider this issue first.

Time is not itself a notion free of ambiguity. Even as an abstract object, it can figure both as a class, e.g. of tensed events (as in 'future in time'), and as a property, an abstraction from such predicates as 'is a time' (e.g. '10 o'clock is a time'). It also has roles as a particular, as for instance with particular times such as the time of the Black Death. But all these roles can be recovered (more or less) from the property of time - using variables restricted by 'is a time' and classes collected with certain tensed predicates, as the logic reveals - so let us concentrate on the property (which is distinguished, where expedient, by capitalisation).

No universals [properties] exist. Time is a universal [a property]. Therefore Time does not exist. The argument is valid. The major premiss is established in chapter 9. The minor premiss has already been obtained. Hence Time does not exist. So in one sense Time is unreal: it does not follow that it is an illusion, or that Time is an inconsistent object.[2]

It is a corollary that the thesis that Time exists if [or iff] there are temporal facts is false; for there are temporal facts such as that Moore is now dead. The thesis was heavily exploited by Moore and forms the basis of his famous argument for the reality of Time (see, e.g., Gale 67, p.69). The thesis is not a commonsense one at all (despite one of the contexts, the paper 'A defence of common sense', in which Moore presented it), but an instance of the Ontological Assumption, namely of a form much favoured by Prior, that x exists if there are facts about x. Since if x has (extensional) properties there are facts about x, the earlier elaborate case against the OA transfers intact to refute this form of it. There are however more relevant counterexamples, e.g. it is a (temporal) fact about Moore that he presented an argument that Time is real, another (temporal) fact that Moore is now dead, so he doesn't exist.[3]

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[1] The importance of the differences for philosophical reality questions has been brought out particularly sharply by Austin 62.

[2] F.H. Bradley's arguments for the unreality of Time should be rejected as logically defective. They purport to show that Time is inconsistent.

[3] Moore's thesis is in effect rejected by relativity buffs, for quite different reasons. On relativity theory there are temporal facts, e.g. some processes are contemporaneous, in the sense that, for any two, part of one is past to part of the other. But Time, insofar as it implies a total chronological ordering of space-time, is not well defined. As Stein puts it (somewhat less satisfactorily)

(continued on next page)

In fact all the usual philosophical arguments for the reality and existence of Time rely at bottom on the Reference Theory, and can accordingly be dismissed.

2. Against the subjectivity of time: initial points. A notable lacuna appears in a well-known argument for the subjectivity of time. According to Augustine, for example,

> Neither the past or the future but only the present really is; the present is only a moment, and time can only be measured while it is passing. Nevertheless there really is time past and future. We seem here to be lead into contradictions (Russell 46, p.373).

Escaping these contradictions leads to Augustine's subjectivist theory of time. But existential and non-existential verbs and quantifiers have not been distinguished. The present exists, the past does not; but the past can still be spoken of, past items can be quantified over non-existentially, and so on; and in this way time can be measured. Thus the past can be signified, discoursed about, and its times metrised, though it does not exist. But not according to the Reference Theory: the Reference Theory blots out all these requisite distinctions. And it is really the Reference Theory, clearly exhibited in Augustine's work (see Wittgenstein 53, p.1 ff.), that forces Augustine to a subjectivist theory of time. According as it is combined with other premisses, the Reference Theory forces its adherents either to platonist, to conceptualist or subjectivist, or to nominalist theories of time. That is, the situation is like that with respect to universals (see further chapter 9). By abandoning the Reference Theory and its associated logic, these old options can be left behind.

Other very different arguments for the subjectivity of time derive from the theory of relativity. A first crude argument is this: Only relativistically invariant notions are objective (cf. Stein 68, p.18). Time is not a relativistic invariant. Therefore Time is not objective. What is nor objective is subjective. Hence Time is subjective. The argument is valid, but several of the premisses are incorrect. Objective notions are by no means limited to those that are relativistically invariant (r-invariant). Most of our ordinary objective notions are not r-invariant, e.g. being a table, now being a unicorn, etc. If a special sense of 'objective' is introduced - what really happens in expositions of relativity theory - then the assumption that what is not objective is subjective fails seriously (it fails anyway on usual senses). Furthermore Time defined as an abstract is, like most mathematical notions, r-invariant; it is

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[3] (continuation from page 35)

> ... although temporal relations have a meaning in relativistic theory, time as a separate concept has no role and no meaning for it (68, p.9).

It is this that leads him subsequently to say, mistakenly, that Time is meaningless, and Minkowski to imply that Time is unreal.

It is a serious question however whether the account of time presupposed should be accepted. According to Stein, 'the quotient set of space-time under a certain ... chronological ordering ... is just what is called "time"' (p.9). This is just false. Moreover ordinary set uses of 'time' do not require relativistic invariance. Time as an abstract can be perfectly well defined from pedicates that are relativistically local.

also not a subjective notion in any good sense. A second even cruder argument is this: Such central notions as simultaneity, succession, the present, etc., which are not invariant can only be accommodated as local notions (with the very frugal accommodation of the received theory of relativity). Local notions are always relative to observers, and so are subjective. Hence central temporal notions are subjective, as Augustine contended. The second premiss is false. Observers are dispensible; on the special theory, inertial frames without observers suffice.[1]

3. The future is not real. Purely future objects and times do not exist (yet at any rate). Thus the future, which concerns these items, does not exist either, and by the time they come to exist, they will be not future but present. Hence the future does not exist, and in this important regard the future is not real. Of course the future is not bogus or an artifice or a human concoction.

The main arguments for the prevailing philosophical position that the future is real, depend, like those for the reality of time, on the Ontological Assumption, and collapse with its removal. Smart's case for the reality of the future, for example, consists primarily of repeated applications of the OA. Thus the following Parmenidean argument:-[2]

> If an object a acquired reality, there would have to be a time at which it lacked reality and a time at which it possessed reality. But to lack reality (or to have any other property), it would have to exist, i.e. be real, which is a manifest contradiction (79, p.3).

Hence, what at any time exists, what will exist, is real. Therefore the future, since comprising what will exist and future times, is real. But withdraw the OA, the contradiction disappears, an object can lack reality without existing and object a can consistently acquire reality having lacked it - in precisely the way that an object can come into existence (as explained and defined in §2). For according to Smart, 'the notion of "real" is fundamentally just that of existence' (p.9).

Other arguments for the reality of the future draw on the theory of relativity and the assumption that 'real' is relativistically invariant. Thus, to illustrate with a very simple consideration, since an event which exists now and so is real is in the future for another observer, the future event should be accounted real by invariance. The short reply to this sort of argument, and elaborations of it (some mentioned below) is that 'exists', and 'real' when it means the same, is not reinvariant. Although this is the obvious and commonsense thing to say given the received theory of relativity, it is regarded as outrageous. Godfrey Smith goes so far as to say,

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[1] Godfrey Smith 76 has added sustenance to this argument by proposing to define 'the present' - and thereby indirectly all tensed discourse - in terms of the class of events seen now by an observer. This introduces an apparently subjective element to many central notions. The definition should be rejected on other grounds as well: its chauvinism, its conflict with the ordinary notion of present.

[2] The Parmenidean element emerges even more strikingly subsequently:

> Notice how hard it is even to state this notion of the unreality of the future (p.9).

Beyond the confines of the Reference Theory however, there is no problem at all in stating and arguing the thesis that the future is unreal.

> It would be sheer hysteron proteron to suggest that existence depends ... upon the dating system representing the local proper time of some observer (76, p.245);

though when something happens and the present can be so specified, 'existence is objective' (p.244), i.e. r-invariant. The force behind the assumption that existence just must be r-invariant is that the alternative leads to violations of the Reference Theory: what does not exist (in certain systems) has properties, stands in relations, objective relations no less, etc. Thus, as far as noneism is concerned, it is a force that does not move. The alternative of going along with the Reference Theory, which there is no reason to follow, leads directly to chronological platonism: everything that at some time exists, exists.

Putnam's much-discussed arguments (in 67) for the reality of the future (and of everything in the world) is similarly met. The kernel of the argument[1] is

p1. Whatever exists now is real

p2. Consider the relation R such that xRy iff x is simultaneous with y in the observer's coordinate system. Then if z stands in the relation R^c to w (where R^c is the transitive closure of R) and z is real then w is real.

p.4 (Relativistic fact) For any a and b of space-time, there is some c in space-like relation to both (i.e. such that c is comparable with neither a nor b under the chronological ordering).

Now let a exist and b be arbitrary, e.g. any thing or event in the future. By p1 a is real, and p4 supplies an element c, such that for some observer a and c are simultaneous and for some observer b and c are simultaneous. Hence aRc and cRb so aR^cb. a is real so, by p2, b is real.

But why accept p2? Putnam's argument supposedly derives it from a heavily and obscurely qualified principle grandly entitled 'There are No Privileged Observers'. But no defence is made of the grand principle and the route to p2 is in doubt. In short, Putnam really gives no reasons for adopting p2. Stein suggests that 'as a leading principle, and part of the explication of reality' p2 (in his own form) 'is very reasonable'. But if its consequences in the argument setting are looked at, it appears most unreasonable. Most ordinary things counted as real, such as trees and trucks and TV sets, are not real, since, like existence-now, they are not suitably invariant under the changes of chronological perspective allowed and required in the reality of the future argument. Putnam has not, then 'soundly refuted the doctrine of the unreality of the future' (Smart 79, p.8).

Moreover for the conclusion he eventually arrives at that 'future things are real' (p.247), Putnam could have much simplified the messy argument. For given (a) future things are things that will exist (p.240); and (b) what sometime-exists, or in Putnam's terms 'tenselessly exists', is real, it follows that future things are real. But why accept (b)? Because if we extend existence (now) to a notion that is r-invariant what we arrive at is sometime-existence, and r-invariance is required for reality. We are back with the basic assumption behind it all: but that assumption has already been rejected.

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[1] Adapted from Stein 68, p.13. Stein's formulation, unless taken as very compressed, is insufficient. It is not merely required that "x is real for y" be transitive (see p.18); also required are principles ensuring observer-simultaneity guarantees reality-for, and that reality-for transfers reality (and then transitivity is otiose).

4. Alleged relativistic difficulties about the present time and as to tense. The difficulties alleged - they come down to the point that such notions as now, the present and those of tensing are not relativistic invariants - are not peculiar to the noneist theory presented. No theory of time that properly speaks some nonrelativese is really immune to these often spurious difficulties.

The main problems for the noneist theory outlined, as for most theories that rely on tensing revolve around the notion of the present, or now.[1] Thence they spread, since tenses are oriented on the present, to tenses, and through EO to existence. Several of the problems arise however from an error - because the present has been mistakenly identified, often by relativists, with the class of events (absolutely) simultaneous with some event now (and here), with the instantaneous world state so specified. Certainly the latter account leads to severe difficulties given the rejection, by relativity theory, of (real) instantaneous connections and the repudiation of a relation of absolute simultaneity. However while the Newtonian theory did justify the identification, it was not part of the commonsense account; and, reflecting that, it was not incorporated in dictionary definitions of 'the present' and 'now'. In fact the attempt to foist an analysis of the present in terms of a class of simultaneous events on the layman or the women-in-the-street (an analysis which has only to be stated to look wild) is largely an imposition backwards from twentieth century relativistic thinking. Neither the class notions nor the universal simultaneity notion had much popular currency before this century, and do not seem to have infiltrated recent temporal notions or assumptions. Ordinary judgments about or involving the present or now are almost always context bound, indeed contextual indicators are important in evaluating judgments involving such (egocentric) particulars. It seems clear furthermore that contexts concerned were almost always local. To force an extrapolation beyond a local region on someone who says 'The sun is shining now' lacks solid ground. Similarly for most ordinary nonmetaphysical judgments of a tensed type: they are "local" claims. And counterintuitive results ensue if an attempt is made to render them nonlocal, invariant.

The theory of relativity in no way upsets these commonsense context bound notions of time and tense: on the contrary, they are regularly used in expositions and discussions of relativity theory. Stein, for one among many, thinks that the special theory of relativity is incompatible with the ordinary notions of time and tense (68, pp.17-8) and, worse for the present theory, with the thesis, varying EO, that all and only things that exist now are real. However the demonstration of the latter incompatibility turns upon assuming again that 'real' is r-invariant. Stein has a further argument:

> If ... we were to insist ... that only things that exist now are real - , we should be led by an argument like Putnam's to conclude that for any event, it and it alone is real; and then, ... we should have the interesting result that special relativity implies a peculiarly extreme (but pluralistic!) form of solipsism (p.18).

Not so - unless we recklessly buy assumptions already rejected. Fortunately there is no need to reconstruct the argument to arrive at these assumptions; for Stein earlier informs us (p.15):

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[1] There are parallel problems for any theory that would do away with tensing in obtaining tenseless dated predicates.

> in Einstein-Minkowski space-time an event's present is constituted by itself alone. In this theory, therefore, the present tense can never be applied correctly to "foreign" objects. This is at bottom a consequence ... of our adopting relativistically invariant language ....

If we do, if we take an r-invariance vow. Then existence now is existence here-now, so what is real also (by the hypothesis) is here-now, and, given r-invariance, what is real cannot be extrapolated (for reasons already seen, that different observers would disagree about the extrapolation). But even more ardent exponents of relativity do not restrict themselves to an r-invariant language. Nor could they without gross impoverishment of their discourse. And why should they? No solid reasons have been given, none are advanced by Stein, though he admonishes Rietdijk and Putnam for not deploying r-invariant notions (indeed he describes their doing so as a 'fallacy'!).[1] Should it be to maintain objectivity, perhaps? That we have dismissed. To avoid parochialness? That we can do, where necessary, by using r-invariant language; after all we are not excluded from doing so. Moreover, when the r-invariance requirement is rightly abandoned we can extend our dating systems beyond our inertial frame, in a way that is not arbitrary, and it is a moot point whether such extensions are conventional in a damaging way. There is no decisive reason then for not continuing to speak in the ordinary non-r-invariant ways, and excellent reasons for continuing to so speak.[2]

5. Time, change and alternative worlds. According to von Wright, there

> appears to be a double dependence of time on change. Time presupposes change epistemologically, and change presupposes time logically (68, p.21).

The theme of interdependence of time and change is indeed a common outcome of verificationist thinking. But remove that setting, allow duly for alternative possibilities, and the main arguments for the interconnections fail. Consider, for example, von Wright's argument that time presupposes change epistemologically, that 'time is a change propagated flow' (p.17). The core of the argument is as follows:

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[1] The clinching objection is sometimes taken to be that what is real cannot depend on choice of a coordinate system. Existence or genuine properties cannot be wiped out by change of a coordinate system. What is real now depends on choice of a frame; what is at some time real does not. Nothing is "wiped out" in this sense; a different cross-section is taken of ongoing processes. All ordinary tensed predicates, which yeild genuine properties do presuppose a frame. But there is no theoretical problem, given the Lorentz transformations, in reexpressing what is said using the predicates in any other frame (of the special theory).

[2] There are excellent reasons also for viewing with suspicion philosophical pronouncements made on the strength of the theory of relativity. One reason for this is that relativity theory was formulated and its philosophical consequences drawn out in a heavily positivistic ethos. Nor has the situation changed much recently: modern philosophical commentary mainly comes from philosophers with marked empiricist bias.

> If the world remained in all its features identically the same on two successive occasions, how should we know that they are two occasions? We cannot use the ticking of a clock or the disintegration of an atom or any other event in nature to distinguish them, for those ways of counting time require that change takes place. If the world under consideration really is 'the whole world', there is no room for the required changes (p.15).

The argument is defeated by counterfactual, or alternative world, considerations. It is enough to say that there could have been a clock, and if there had been a clock then (ideally) no other change would have occurred than its recording of succession, or better, that from an alternative world like it but for a clock, the lack of change could be verified. So what is right is not 'that in a world without change the concept of time would have no application'[1], but only a much weaker thesis to the effect that time presupposes the possiibility of change. Von Wright's Kantian way of stating his thesis - 'If we "think away" change from the world, we cannot think of the world as persisting in time' (pp.189) - is similarly vulnerable. Some of us can violate the conditional by thinking of other worlds where the changelessness of the world is recorded, much as we can envisage other worlds without change upon which we can impose the local temporal grid.

With the alternative world semantical picture it is not difficult to solve the 'well known puzzle to which the assumption that time depends on change gives rise':

> Assume the world came to a complete standstill, that no further change took place in it. ... Shall we also say that time comes to an end, that after that time there is no time, indeed no 'after'? (p.17).

Yes, according to von Wright:

> The appearance to the contrary is due to the fact that we refuse to take the idea quite seriously or, rather, that we combine it with another idea, inconsistent with it, of someone, a 'god', being there to contemplate this dead world in time (pp.17-8; emphasis added at beginning).

There is only an inconsistency if the someone is in the world. There is no inconsistency in having an ideal observer in a different world, perhaps with its own time, contemplating our now static universe. That is perfectly in order, as the relation of contemplation is intensional and induces no interference in the static world. In short, contrary to von Wright, the requisite 'machinery' does not have to 'go on somewhere else in the universe'. Only a one-world view would oblige such a conclusion.

The argument that change presupposes time logically is nearer valid, but again not decisive. The argument is that 'change without time involves contradiction', attributions of contradictory features to one and the same object. To escape contradiction, however, it is enough to find a difference, in factor, which is "time-like". Thus, for example, a hardline positivistic exponent of Einstein-Minkowski space-time like Stein, who jumps to the conclusion that 'although *temporal relations* have a meaning in the theory, *time* as a separate concept has no role and no meaning for it' (68, p.9), can nonetheless accommodate change consistently. The differences in factor which resolve contradiction do not, that is, imply a difference in time in the intended sense; only a very stunted notion of "time" which need not meet expected temporal ordering conditions results.

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[1] A claim that is also stated in the misleading form 'Time cannot exist without change'.

6. *Limitations on statements about the future, especially as to naming objects and making predictions*? According to Prior (57, p.34, 67, pp.143-5), and apparently to Ryle (54, pp.25-7), one cannot say, for example, 'It was the case 100 years ago that A,N, Prior did not exist'. But the sentence is surely significant, it can easily be symbolized in a neutral chronological logic, for example thus: $(Pt)\,(t<0 \;\&\; t \oplus 100 \text{ years} = 0 \;\&\; \sim(\text{A.N. Prior } E,\, t))$, and it certainly appears to be true. So one can say it, and say it truly. Prior responded that

> if 'A.N. Prior' is a logically proper name, one cannot *truly* say this, though one *can* truly say 'It is not the case that it was the case 100 years ago that A.N. Prior exists', One can also truly say 'It was the case 100 years ago that there was no A.N. Priorises'.

We have already observed that the implied thesis, that the logical status of a name depends on whether the bearer exists or not - a thesis, forced by the Ontological Assumption, that *might* legitimately be abused for making logic parochial - has severe effects on logical theory. A much more drastic position is however sometimes taken with respect to future objects.

While Prior amended his thesis to hold that there were limitations on naming purely past objects, limitations confined to *logically proper* names, a much more sweeping thesis has been stated with regard to purely future objects, namely,
(α) One cannot name a purely future object.
There is no restriction to logically proper names. A corollary is a generality of predictions thesis,
(β) Predictions about purely future objects are (irreducibly) general, and more generally,
(γ) There are no particular facts about purely future objects.
All these theses are advanced by Godfrey Smith 78.[1]

The main source of these theses is again the Reference Theory. This is clear enough in Ryle 54, where appeal to or reliance on the Ontological Assumption underpins all the arguments, e.g. 'When I predict the next eclipse of the moon, I have indeed got the moon to make statements about, but I have not got her next eclipse to make statements about' (p.27), and more generally (though Ryle is a little devious about this) the 'logical' reason why one cannot give individual mention to future objects or make singular predictions about them is that 'one has not got them to make statements about' (p.27). The reliance is also indicated by the 'queer logical fix' Ryle finds himself in (p.25) trying to speak of things that were prevented, averted, and so on, from happening or existing, analogues of the 'negative existential' "problem": we cannot, according to Ryle, claim about any particular event that it was prevented! The reason is said to be that

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[1] These theses may also be found in other sources; a stronger version of (β), with 'purely' deleted, was advanced by Ryle. Godfrey Smith argues, as against Ryle, that we can make predictions about particulars if they have begun to exist and so are nameable, and also that Ryle is mistaken in treating future tensed statements as about events, a point that removes some of Ryle's examples.

> What does not exist or happen cannot be named, individually indicated or put on a list, and cannot therefore be characterised as having been prevented from existing or happening (pp.25-5).

Here is an open-ended list: Sherlock Holmes, Kingfrance, Rapseq, Ruritania, 2001, ... Or consider again the cyclone code-named Thales which did not eventuate. And so on.

Godfrey Smith is more straightforward, and his 78 abounds with referential theses, which are unsupported and presented as if they were obvious. But - at least as seen from outside the referential paradigm - they are false and counterexamples or counter-considerations are not difficult to find. Here are some examples: 'nonexistent items clearly cannot be the subjects of singular propositions' (p.18); 'for the prediction to be singular it is necessary (only) that its subject expression refer to an existing individual' (p.18, brackets added); 'we fail to precognise the future ... because there is just nothing "there" to causally act on the present' (p.17); 'before an individual exists no statements at all can be made about it' (p.20); 'in a world in which Gilbert Ryle did not exist it would be impossible to know that he was absent from it' (p.20); 'after, and only after, an individual has come to exist can it be taken as the logical subject of a proposition' (p.21); 'in the case of future "individuals" there is nothing about which information might be gathered' (p.23); 'the supposition that a future "individual" might have a different life-"history" to the one that it will have is one that cannot intelligibly be entertained' (p.24).

There are three sorts of considerations Godfrey Smith appeals to in defending (α)-(γ), all of a referential cast. Firstly, there is direct appeal to the Ontological Assumption. There are no entities for the facts of (γ) to be about, hence (by the OA) (γ) holds.[1] This confirms (α) since there are no particular facts about such nonentities one could hardly name them, or particular facts would be forthcoming. In any case the Ontological Assumption yields (α) directly since purely future objects do not exist.[2] For if the objects could be named one could talk about what does not exist. Secondly, thesis (α), and so (β) and (γ), has been bolstered by the causal theory of names. For on that theory future objects cannot be named without, what is presumably impossible, inverse causal chains leading from the future back to the present (in the one local frame).[1] The (referential) causal theory has, however, like the Reference Theory, already been criticised and found seriously wanting, and accordingly rejected (see 1.14).

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[1] That there are particular facts about future objects implies, by OA, there exist future objects.

[2] There is a severe tension in Godfrey Smith's work (76 and 78) as to what exists. On the one hand, when confronted with relativity he insists that existence is objective and r-invariant; on the other hand, he contends that purely future objects do not exist ('There are no future individuals', 78, p.24). But what is future terrestrially is present or past from other chronological perspectives. R-invariance will accordingly lead to the conclusion that nothing exists, contradicting his claim that present (and past) individuals do exist.

Thirdly there are the inevitable arguments from 'want of distinct identity', the arguments of Peirce and Edwards against future and possible individuals (arguments refurbished in the latter case by Quine, and discussed in chapter 3).

> The difficulty in treating Ryle and a future individual before he existed is that it could not be intelligibly asked at those times before he existed which future individual or unactualised possible he then was (p.21).

Why not? 'Will Gilbert Ryle be red-headed?', 'Will he become a philosopher?' are perfectly significant, and intelligible, questions, which could have been asked before Gilbert Ryle was conceived. The future Gilbert Ryle can be singled out furthermore by descriptions which contingently identify him.[2] The absurdities we are supposed to be led to in treating Gilbert Ryle 'as having once been an unactualised possible' (p.22) are not stated, so they are hard to assess.[3] In trying to make his identity objections stick, Godfrey Smith has to fall back firstly on the Ontological Assumption itself ('at present we have no way of knowing which individual this will be because there is at present no individual for the prediction to be about' (p.22); 'we could not rule out the possibility of mechanical malfunction or failure in ... the stone cutting machine of incredible precision ..., as a result of which the individual to which we were apparently referring, as it turned out, did not come to exist' (p.24)); and secondly (as the latter quote indicates) sceptical considerations ('however detailed we make the prediction it will never be sufficient to distinguish (a unique) possible competitor to satisfy it', p.23; 'any description of the statue is still general. There are an indefinite number of surfaces which might have been revealed by the labours of the sculptor', p.23). In fact there are definite descriptions that could have been used in 1899 to uniquely and unproblematically contingently identify Gilbert Ryle, and it is simply not material that it is logically possible that other individuals might satisfy those descriptions (as they might). Moreover there are soon-to-exist individuals that nothing short of scepticism about the future (backing a resolve to hang on to (α)-(γ)) would stop us naming and ascribing properties to, namely all those code-named or individually labelled objects assembly-line factories are producing.[1] Consider a precision number plate machine, which has just stamped out plate 'HVP 731', and is about to produce a plate just like HVP 731 except that it will bear the label or (as the assembly line workers who have all had a training in arithmetization say) name 'HVP 732'. HVP 732 can be described in very considerable detail, there are many particular facts about it. Its features appear to refute (α)-(γ). Godfrey Smith would say the machine might break down. Everyone on the line and elsewhere is determined, even if it does break down (contrary let us say to all the evidence since the machine is in perfect working order, has its own power supply and plenty of fuel, etc.), to get it going, by hand power if necessary, just to refute (α)-(γ). Well, one could imagine a surprise nuclear explosion upsetting these plans, cosmic interference, etc., but now the theses depend for their defence on a scepticism about the future (that should be rejected on other grounds).

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[1] As one of the quotes above indicates Godfrey Smith thinks there can be no such chains (76, p.17).

[2] Godfrey Smith's objections to appeals to descriptions (p.22) can be met by a distinction of identity determinates, in much the way that some of Kripke's objections to use of identifying descriptions can be met (see also 1.14).

[3] The "parallel" from Edwards has nothing to do with future objects, and insofar as there is any absurdity at all in Edwards' numerous examples, this derives from questions as to the distinctness of supposed indiscernibles. The 'worries' Prior claims are 'surely senseless' are not, but are intelligible, and the alternatives considered by the "fortune teller" are 'at that time' 'distinct', as but a little alternative worlds semantics will reveal.

7. Fatalism and alternative futures. Ryle introduces his strong generality of predictions thesis - the thesis that while, or even if, singular statements can be made about the past and present, statements concerning the future are irreducibly general - in the course of and in order to deal with a fatalist argument. But the generality thesis is quite unnecessary in order to deal with the argument Ryle calls 'the fatalist argument'. Though Ryle accounts the argument 'a severe and seemingly rigorous argument' (p.16), the argument he presents involves an elementary modal fallacy, namely (a variant on) the argument $\sim\Diamond(A \,\&\, \sim B)$; but A. Therefore $\sim\Diamond\sim B$;[2] and fails once the fallacy is exposed.

Ryle's formulation of 'the fatalist argument' considers first the particular statement q_0, namely "Ryle coughed and went to bed on a certain Sunday (viz. 25 January 1953)", and the main trick is pulled before Ryle goes on to generalise. Since q_0 is true it was certainly true on the day before.

> Indeed, it was true a thousand years ago that at certain moments on a certain Sunday a thousand years later I should cough and go to bed $[T(-1000)q_0]$. But if it was true beforehand - forever beforehand - that I was to cough and go to bed at those two moments on Sunday, 25 January 1953, then it was impossible for me not to do so $[T(-1000)q_0 \rightarrow \sim\Diamond\sim q_0]$. There would be a contradiction in the joint assertion that it was true that I would do something at a given time and that I did not do it $[\sim\Diamond(T(-1000)q_0 \,\&\, \sim q_0)]$. This argument is perfectly general. Whatever anyone ever does, whatever happens

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[1] Other examples are provided by dates. Next year is called '1980'. 1980 is an individual year; it is presently purely future. There are many particular facts about it, e.g. necessarily it succeeds 1979, contingently some sales of this book (itself a future object) will occur in it, etc.

[2] The modalities need not be logical ones. 'It is impossible that' can be treated as determinable in the argument.

> anywhere to anything, could not not be done or happen, if it was true beforehand that it was going to happen [$T(-t)A \rightarrow \sim \sim A$]. So everything, including everything we do, has been definitively booked from any earlier date you like to choose (p.15).

The particular case relies on the fallacious argument: $\sim\Diamond(T(-1000)q_0 \,\&\, \sim q_0)$; so $T(-1000)q_0 \rightarrow \sim\Diamond\sim q_0$. But $T(-1000)q_0$. Therefore $\sim\Diamond\sim q_0$.[1] In the general case Ryle does not bother to state a main premiss, the truth $\sim\Diamond(T(-t)A \,\&\, \sim A)$, but slides immediately to the false $T(-t)A \rightarrow \sim\Diamond\sim A$.

So much for Ryle's argument; but can the damaging assumption $T(-t)A \supset \sim\Diamond\sim A$, or something like it, be independently defended? The answer is Yes, by a no-branching-futures assumption of some form. Less obscurely, the assumption can be enforced by

(a) a Diodoran account of necessity, or
(b) a no-alternative-worlds thesis.

Consider (a). An apparently damaging assumption, $(t \leqslant 0)T(-t)A \supset. \sim\Diamond\sim A$, can be sustained by defining necessity thus: $\Box A =_{Df} (t \leqslant 0)T(-t)A$.[2] But firstly, the definition - not Diodorus's (likewise faulty) definition which was in terms of all times - does not define necessity at all, but only a variant of Prior's functor H, 'It was always the case that'. Secondly, even if the definition is accepted, only a "fatalism" without bite would result. For the only sense in which it could be established that something could not not happen would be the relatively trite one that it was always true that that thing did happen. No necessity is thereby imputed to the happening; in no serious sense could it not have been otherwise. Thesis (b) likewise tends to collapse modality, e.g. necessity to truth or some qualified "sort" of truth such as tenseless truth or omnitemporal truth - insofar at least as exponents of (b) are prepared to admit or tolerate modal notions at all. Again only a "fatalism" without sting emerges. If however (b) is combined with a limited account of necessity (certain grades thereof) in terms of logical truth (e.g. truth in all classical models), then once again fatalism only results by commission of a fallacy: for truth at all previous times is no guarantee at all of logical truth.

Fatalism suggests that the future is fixed, already fixed, and now unalterable. This view, and the determinism with which it tends to converge, is encouraged by a set of faulty and misleading pictures such as the already written Book of Destiny (considered by Ryle, pp.15-6), as opposed to the (also misleading) metaphor of the Moving Finger (of Omar Khayýam), or the rolled out carpet, as distinct from the rolling out carpet. As Prior puts it:

> ... what is the case already has by that very fact passed out of the realm of alternative future possibilities

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[1] The argument, as formalised, also involves the fallacy: $\sim\Diamond(A \,\&\, \sim B)$, so $A \rightarrow B$. But this fallacy is readily avoided by replacing $A \rightarrow B$ by $A ⥽ B$ or $A \supset B$. (The argument need not trespass beyond the elementarily consistent, so γ is admissible.)

[2] The alternative definition $\Box A =_{Df} (t<0)T(-t)A$ is inadequate, because (at least on a discrete time theory) $\Box A$ does not guarantee A. For something may upset A between the last previous moment and now.

> into the realm of what cannot be altered (62, p.241).[1]

But in order to explicate the respect in which the future alternatives are closed as what was future becomes present and past, alternative cases or worlds have to be (neutrally) spoken of and quantified over. Such is anathema in referential quarters. Thus for instance, Smart (79, p.12):

> It makes no more sense to talk of altering the future than it does to talk of altering the past. ... There are no more alternative futures than alternative pasts.

The second claim conflicts with the first. What Smart means by the somewhat misleading claim that it makes no sense, is what he shortly says, that one 'cannot alter the future'. For, so the argument runs, the future is what will be and, tautologically, what will be will be. The argument, and its elaborations, e.g.,

> Whatever change I make or do not make in the manuscript is in the future part of that manuscript (p.12),[2]

deliberately miss the intended point - deliberately, because no-alternative-worlds positions cannot adequately render intelligible (and sometimes true) discourse about altered and alternative futures. Consider such claims as that Bismarck's unification of Germany altered the future course of European history. Assuming the claim is true, it makes good sense to say that what Bismarck did altered the future, that is, to elaborate, altered the future from what it would otherwise have been, i.e. without his doings. Or slightly differently again, but for Bismarck things would have been different; an alternative (and better) future would have eventuated. Naturally, the familiar explanation makes use of counterfactuals (which can in turn be explained through, and help explain, alternative cases), but that's alright. More generally, the weak form of fatalism Smart advances, a form built into the closed futures of Minkowski diagrams, is upset by counterfuturefactual considerations. Things could go differently in the future in a way they could not go differently in the past, the future can be altered as the past cannot, the future is open in a way the past is not.[3] Such differences, incidentally,

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[1] But it can also be made less platonistically, by replacing 'realm' by a neutral term. Prior also puts it thus, in explicating Aristotle's questionable formulation of the point:

> when it passes from the future into the present and so into the past, a thing's chance of being otherwise has disappeared.

Certainly it is logically, also physically, possible that a which is (in fact) f [or was f] is not f [or was not f]. Future possibilities are a subclass of physical possibilities.

[2] There are no alternative futures because whichever alternative comes to pass is the future. But that in no way rules out alternative possibilities, all it shows is that one alternative among the possibilities will be how things are.

[3] The outlines of the requisite semantical picture are clear enough even if the details are not. The picture is like that of an indefinitely growing tree that, like some eucalypts, drops its branches as it grows: the main unbranched stem is the past, the present is where the branching begins to occur, alternative futures are the branches, one of which is, at least in initial

(continued on next page)

between past and future along with the alignment of cause and effect disclose - what is often supposed to be a mystery - the direction of time. It is this asymmetry of time, together with the openness of the future, that have encouraged even referentially-inclined philosophers to contrast the reality of the past with the unreality of the future. Neither however are real.

Ryle's and Smart's arguments are but two of the many arguments that seem to lead to fatalistic conclusions.[1] One of the reasons why fatalism has managed to maintain its logical grip, and its charm, is that it comes in so many forms, with different arguments. Wherever one is cut down another - so it seems on first acquaintance with the problem - springs up in its stead. However the arguments are of limited variety, and one and all fallacious, the logical versions turning on modal fallacies. Following Cahn (64, p.295) fatalistic arguments and the positions they lead to can be roughly divided into (i) *logical* fatalisms, according to which it is necessary that the future be what it is going to be and impossible that it be any thing other than what it is going to be. In these days of reductions of such modalities to the logical, it is usually taken that the necessity is logical necessity and the impossibility logical impossibility. (ii) *empirical* fatalisms, according to which our deliberations and efforts are pointless and do not influence the future.

The argument Ryle presents gives a fatalism of the logical sort. An even simpler fallacious argument of this sort is this: Necessarily what will be will be. Therefore, what will be necessarily will be. The fallacy, $\Box(A \rightarrow B)$, so $A \rightarrow \Box B$, is the same as that which proves that whatever is known must be necessarily true, whence knowledge can never be of the merely contingent.[2]

For an example of (ii),

> Consider the proposition that Mr A will become a great philosopher. This proposition is either true or it is false. If it is true, then Mr A will become a great philosopher, no matter what else he does. On the other hand, if it is false, then, no matter what else he does, Mr A will not become a great philosopher. Therefore, it makes no difference whether Mr A studies hard or not, since in either case, his studies will have no bearing on the outcome.

All the argument as far as the 'therefore' establishes, given that "no matter what else he does" can be tacked on to each disjunct, is that Mr A will or will not become a great philosopher no matter what else he (in fact) does. But this is analytic (as A v ~A v B). What follows the 'therefore' makes a

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[3] (continuation from page 47)

stages, strongly indicated as leading. A little more exactly, in the model there are worlds which are alternative possibilities for the present whose pasts coincide.

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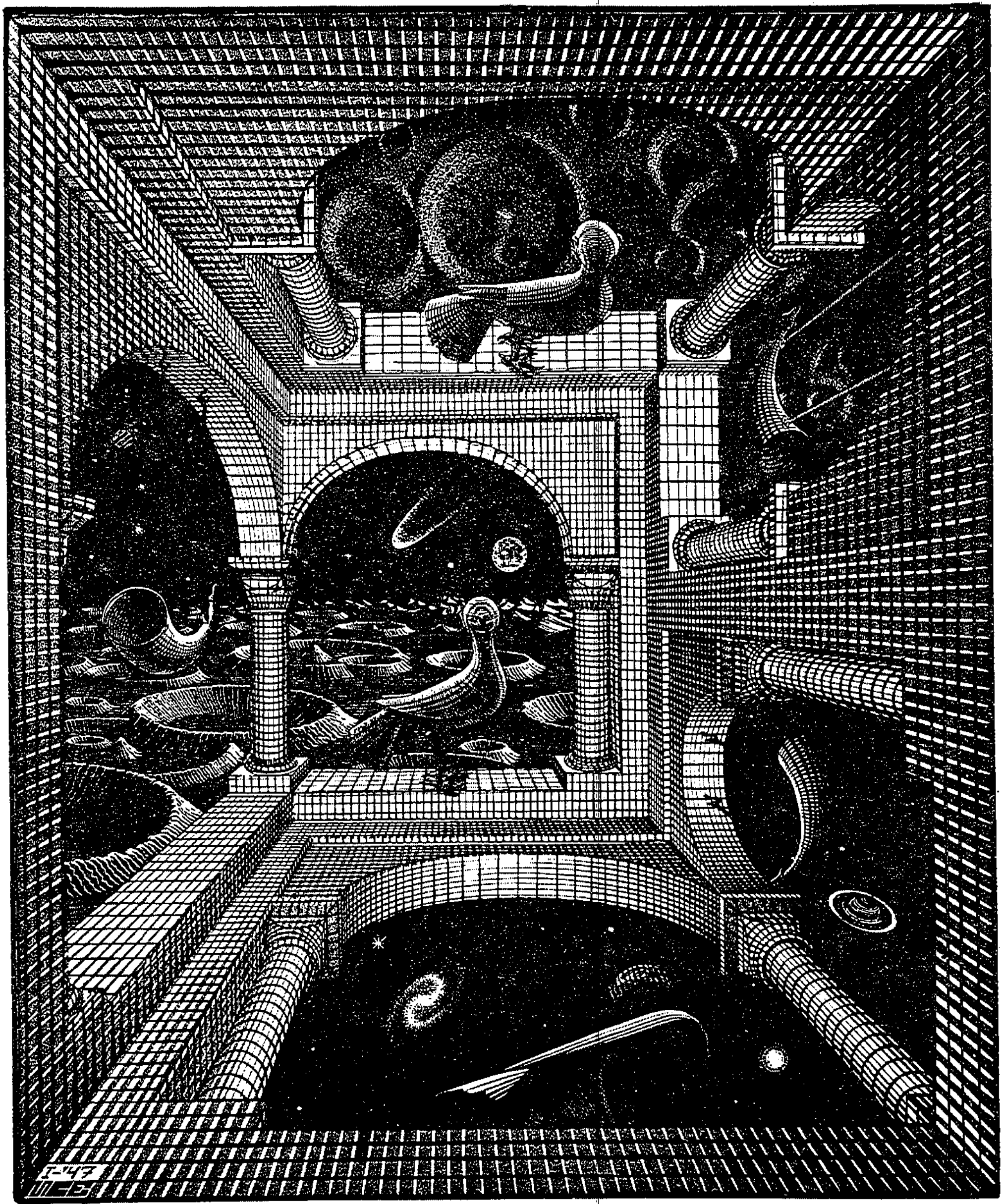
[1] A rather different argument can be based on the theory of special relativity: see Stein's criticism of Rietdijk's "proof" of determinism (68, p.13).

[2] Aristotle's sea-battle argument can likewise be seen as involving a distributional fallacy, of an intensional functor over a disjunction: roughly, where D represents 'It is determinate that' from D(A v ~A) to DA v D~A.

contingent statement (a contingently false one perhaps). Hence the argument is a nonsequitur, since a necessary statement cannot imply a contingent one. For $A \Rightarrow B \supset . \Box A \supset \Box B$. It may however be contended that precisely what the argument shows is that, contrary to appearance (and to semantical modellings of the conclusion), the conclusion is necessary. But it is not necessary because it is falsifiable: there are possible circumstances where it is false, where it makes a difference, one way or the other, what else Mr A does (and *would* do). Suppose for instance, Mr A commits suicide. This no doubt destroys what small prospects Mr A had of becoming a great philosopher, and so makes a difference. Hence the acclaimed conclusion does not follow. In this case it is false that Mr A will become a great philosopher. Does it not matter what else Mr A does? In one respect No (the 'what will be will be' respect). In a more important respect, that of accounting for the falsity assignment, it matters considerably that Mr A did what he did. It is false that Mr A will become a great philosopher, *because of* what he did, *not* no matter what he *did*.

Part II
Newer Essays



CHAPTER 3

ON WHAT THERE ISN'T[1]

Most things do not exist. For every thing that exists, e.g. Professor Smart, there are several things that do not exist, abstractions beginning with the property of being Professor Smart and the set of properties of Professor Smart. And there are a great many abstractions other than those directly generated by things that exist. These truths we hold to be elementary, and if not self-evident they can be argued for. Quine, however, in a very bold stroke, has stolen much of the terminology we ordinarily use to state, and argue, these elementary facts - and as far as most philosophers are concerned, he has got away with it.

The theft is evident from the first lines of Quine's 'On what there is' with the discussion of which this chapter is primarily concerned. The ontological problem is there said to be formulable as 'What is there?', and answered 'Everything'. But the ontological problem in question is the problem as to what exists or (perhaps differently) of what has being, which is not just a very different problem from the more easily answered question as to what items there are, but a problem which is not truly answered 'Everything' since many things do not exist. The theft is of the English expressions 'what', 'there is', 'is', 'thing' and 'everything' which are commonly enough used, without existential import, to consider and talk about items that do not exist and have no being. Just consider 'what is' questions concerning fictional objects or the objects of false theories, e.g. 'What is a hobbit?' 'What is phlogiston?', or such questions as 'What is an impossible thing?', 'What is a merely possible thing as distinct from one that exists?' It is not merely ironical then that Quine should subsequently (p.3) magnanimously give away the word 'exist', claiming that he still has 'is'.[2]

Once the stolen goods are restored it is no great feat to resolve many long-standing, but gratuitous, philosophical puzzles, beginning with the Platonic riddle of non-being, that 'non-being must in some sense be, otherwise what is it that there is not?' (pp.1-2). Consider some thing, a say, that does not exist, e.g. a is Meinong's round square. Then what does not exist is in this case a, but it in no way follows from "a is non-existent" that "a exists". Such non-entities as a need have no being in any sense. It is basically because whatness and thinghood have been illicitly restricted to what exists or has being that a puzzle seems to have arisen: for certainly we contradict ourselves if we say that what has being does not have being. There is no contradiction however in saying that what is a thing or object, e.g. a, may have no being in any sense; and this dissolves what Quine nicknames Plato's beard without using, or blunting, Occam's razor. For Occam's razor to stay sharp requires only that entities not be multiplied beyond necessity; but no multiplication of entities has been made, no bloating of the universe (of what exists) has occurred. Indeed noneism enables a very substantial reduction in what is said to exist, so that what is said to exist can coincide with what really does exist, namely only certain particular objects now located in space.[1] But, more to the point, Occam's razor embodies various muddles of the very sort that we are concerned to remove. In particular, Occam's dictum that entities (or differently objects) should not be multiplied beyond necessity supposes that it is in our power to increase or decrease the number of entities (or objects): but of course in that sense - as opposed to the destruction or creation of objects by one's activity - it is not. What we can increase or decrease is not what exists but what we say exists, what we (choose to) talk about, and what our theories commit us to in one way or another. So the dictum confuses what exists with what we (choose to) talk about or what we, or our theories, say exists - a confusion that runs through into modern criteria for ontological commitment.

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[1] This chapter is a noneist commentary on 'On what there is', the first essay in Quine's FLP. All page citations without further detail are to FLP.

[2] Nor is ontology exactly independent of lexicography, in the way Quine suggests.

Because a has no being there is no cause to try, like Quine's philosopher M^cX, to assign some kind of being to a, e.g. ideational existence as an idea in men's mind. Pegasus and the Pegasus-idea remain, as they are, distinct items: Pegasus is a horse, the Pegasus-idea is not, since ideas are not (significantly) horses; Pegasus does not exist, but the Pegasus-idea is presumed to; and so on.[2] The false dichotomies, spawned by empiricism, that Quine relies upon in putting the mythical M^cX on the spot can equally be dispensed with, e.g. that whatever has being exists either spatio-temporally or as an idea in men's minds. Since a does not exist, it does not exist in this or that way. Like other alleged problems about a the problem about how or in what way a exists vanishes given that a does not exist.

The initially commonsense noneist position being advanced is not to be confused either with that of Quine's other non-existent philosopher, Wyman.[3] For it is not maintained that Pegasus, for instance, 'has his being as an unactualized possible', (p.3) or as anything else, since he simply has no being. More generally, the transformation of 'c is d' (e.g. 'what I am thinking of is Pegasus' or 'Pegasus is an unactualized possible') to 'c has its being as d' (e.g. to 'what I am thinking of has its being as Pegasus' or 'Pegasus has his being as an unactualised possible') is to be rejected. Nor is it maintained, as by Wyman, that Pegasus is (p.3). The expression 'Pegasus is' is, like 'Pegasus likes', deviant in many English idiolects (including mine): its incompleteness is suggested by questions like 'is what?'. Insofar as 'is' functions intransitively, 'x is' means, as the OED indicates 'x exists'. In short, we can give Quine the intransitive use of 'is', and so (as in the title of this essay) of 'isn't'. Since the noneist position certainly does not claim that Pegasus exists, or, as Wyman puts it, subsists (i.e. exists, though perhaps in a very low level way), it does not claim, in Wyman's way, that Pegasus is.[4] It follows, using the first account Quine gives in (FLP) of commitment to an ontology (on p.8), that noneism is not committed to an ontology containing items that do not exist, such as possibilia and

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[1] It was Meinong's thesis that any existing object has a more or less definite location in space and/or time. It is a corollary that abstract objects do not exist. See further chapter 9.

[2,3,4](Footnotes on next page)

(Footnotes 2, 3, 4 from previous page).

[2] Detailed arguments that ideas are different from the objects they present were given by Meinong. One of these, set out more formally, as in EP, p.xxv, runs as follows:

1. Ideas are, by their very nature, of something (some object).
2. Ideas, when they occur, exist.
3. If ideas were identical with their objects, all their objects would exist whenever someone was having an idea of them.
4. But there are objects which never exist (e.g. the perpetuum mobile and Pegasus), yet there are ideas of them.
5. Therefore, ideas are not identical with their objects.

Elsewhere (59, p.199) Quine himself makes a similar distinction:

> ... to identify the Parthenon with the Parthenon-idea is simply to confuse one thing with another; and to try to assure there being such a thing as Cerberus by identifying it with the Cerberus-idea is to make a similar confusion.

Yes, to confuse one thing with another. Quine's 'essential message' in 59, §33, repeated over and over, is however that

> Some meaningful words which are proper names from a grammatical point of view, notably 'Cerberus' do not name anything (p.202),

otherwise briefly referred to as 'the mistaken view that 'Cerberus' must name something'. In fact, but not, of necessity, 'Cerberus' does name something, not the Cerberus-idea, but Cerberus. There is no mistake: 'Cerberus' names Cerberus, whence, particularising, 'Cerberus' names something. Quine's message is a plea to have us restrict quantifiers to existentially-loaded ones; for it is true that 'Cerberus' does not name anything existent. There are excellent reasons, as we have seen, for ignoring such pleas, for not so limiting quantificational apparatus. Nor does the removal of existential restrictions involve any of the mistakes Quine imagines he finds in taking nonentities in the domain of quantifiers or as named: there need be no confusion of meaning with naming (though meaning can be explicated through interpretation - which is wider than naming - in worlds); there need be no confusion of meaning with things talked about (but naming is a subspecies of being about); there need be no appeal to attempts, inspired by the Ontological Assumption, to make nonentities exist somehow (e.g. as shadows of entities, or names) or somewhere (e.g. in the mind, in myth or fiction); and so on.

[3] Philosophical legend has it that Wyman is modelled on Meinong, but the serious discrepancies between Wyman's position and any but a hearsay Meinong position cast some doubt on the legend. Wyman is somewhat more like Russell 37.

[4] Meinong's position diverges from the stream of noneism here followed: for according to Meinong possibilia such as Pegasus subsist. Insofar as this implies more than that possibilia are possible - in some or other of the commonly confused senses, e.g. that they could exist or that the supposition of their existence leads to no contradiction or that their characterisation leads to no contradiction - it should be rejected as misleading.

abstractions, since, for each such x, it is true that x is not.[1]

As regards impossible items such as the round square cupola on Berkeley College Wyman's position differs drastically from noneist alternatives.[2] Unlike 'purple happy number', there is nothing meaningless about 'round square cupola', which is what Quine has Wyman say (p.5). This does not mean that noneists admit 'a realm of unactualizable impossibles': 'realm' like 'universe' carries ontological overtones. Although some items such as round squares are impossible, and we can accordingly form non-null sets of impossibilia, these sets do not exist, any more than their elements or than other abstract sets.

It is widely thought nonetheless, despite the differences between Wyman's position and those of a more Meinongian turn, that Quine's scholastic objections to Wyman's unactualised possibles do serious, perhaps irreparable, damage to all these positions. Thus, for example, Kenny (68, p.169): 'these objections, I think, make untenable the notion of Meinongian pure objects'. This is far from the truth, as we now try to show. Quine's main charge (p.4) is that possible objects are 'disorderly' and 'well-nigh incorrigible', and the basis of the charge is to be found in the suggestion that 'the concept of identity is simply inapplicable to unactualized possibles'. But the very same notions of identity - most importantly, extensional identity - and distinctness that apply to entities apply likewise to nonentities. Identity is, as always, reflexive, symmetric, transitive, holds given indiscernibility, and warrants qualified replacement. The criterion for identity of nonentities is, as for entities, coincidence in extensional properties. Thus, for instance, Hercules and Heracles are identical, though some people did not and do not know this. The criterion for distinctness is that of positively differing on extensional properties. Thus, for example, Pegasus is distinct from Thunderhead because Pegasus has the (extensional) property of being winged and Thunderhead does not. Hence nonentities can 'meaningfully be said to be identical with themselves and distinct from one another' (p.4). Moreover, far from 'the concept of identity being simply inapplicable to unactualised possibles', precisely the same criterion as that given, and ordinarily used, is presupposed classically - on one common theory - in such results, for example, as that Pegasus and Chiron are one and the same because they have the same traits (namely none). But, strictly, what is true of nonentities classically depends on the theory of names and descriptions adopted.[1] On Russell's theory of descriptions all nonentities are identical, indeed all statements concerning unactualised possibilia b and c are indeterminate because it is false that b = c and false that $b \neq c$. At this point a latent inconsistency in Quine's stance becomes apparent. For it cannot both be false - as it is on Russell's theory which Quine endorses (pp.5-6) - and meaningless, in the sense of concept inapplicability - as Quine suggests it is - that nonentities are identical and not distinct.

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[1] Observe that the result differs from that obtained by applying Quine's other and better known criterion for ontological commitment, according to which ontological commitment is determined through preparedness to quantify (p.12). In these terms noneism is ontologically committed to what it maintains does not exist, e.g. possibilia, abstractions and so on. A corollary is the inadequacy of the quantificational criterion that 'to be is to be value of a bound variable' (p.15). The inadequacy of Quine's case for the criterion is discussed below.

[2] Including Meinong's position; see, e.g. EP, chapter 2.
The same supposed dilemma as in FLP is colourfully presented in Quine 59, p.202:

> Having already cluttered the universe with an implausible lot of unactualised possibles, are we to go on and add a realm of unactualised impossibles? The tendency at this point is to choose the other horn of the supposed dilemma, and rule that expressions involving impossibility are meaningless.

That is almost certainly not the main historical tendency; and it is a tendency to which there are serious objections (see SL). The supposed dilemma is no dilemma, not for the reason Quine offers, that 'there need be no mystery about attributing non-existence where there is nothing [existent] to attribute it to' (and we have observed the inadequacies in reductions of talk of nonentities to talk of entities), but because the first option can be restated neutrally. There are, and need be, no additions to the universe (of entities) of new realms: the population, or number of elements, of the entity-universe is unchanged. Talk of 'cluttering', 'implausible lot', etc., reflects inappropriate referential thinking.

The criteria for identity given, whether nonclassical or classical, also serve to undercut Kenny's overstatement (68, p.168):

> The most serious - indeed the insurmountable - objection to Meinongian pure objects is that it is impossible to provide any criterion of identity for them.

But, despite the ready availability of criteria, the objection, that nonentities have no (clear) identity conditions, is repeated over and over in the literature. Another recent example, where the objection is used as ground for putting aside Meinong's theory, may be found in Linsky (77, pp.35-6, our transposition):

> Meinong comes nearest to capturing ...
> our intuitions about reference in natural language
> and his theory does not seem to lead to contradiction
> as it is widely supposed to do. What disturbs us about
> his ontological population explosion, I believe, is
> that these objects have no clear identity conditions.

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[1] For instance, on Quine's ML, which includes a Fregean style theory of descriptions much inferior (in all but technical ease) to Russell's theory, nonentities have the most amazing properties. For example, Pegasus is identical with the null set - so that concept of identity is certainly applicable - and has all the same properties, e.g. Pegasus exists, but has no members, Pegasus is a subset of every set whatsoever, and all the natural numbers are simple logical constructions of Pegasus. The data concerning nonentities may be a little soft - but it is not that soft.

> Is the present king of France identical with the present king of China? There seem to be no principles which can be used to provide an answer to such questions. One answer is as reasonable as the other and this makes the very notion of an *object* seem misapplied here.

Apart from the very first claim, this requires correcting claim by claim. Although Meinong's theory, if carefully (re-)formulated, does not lead to contradiction, the account Linsky gives (77, p.34) does lead to contradiction (given only a very minimal logic):

> But Meinong insists, against Frege that what phrases of this form [$\ulcorner(\iota x)\ (\phi x)\urcorner$] denote is always $(\iota x)(\phi x)$ .... The insistance that '$(\iota x)(\phi x)$' denote the right thing leads immediately to a special case of the independence of *Sosein* from *Sein*, for it entails that $\phi(\iota x)(\phi x)$ is always true for any choice of ϕ.

That for every ϕ, $\ulcorner(\iota x)(\phi x)\urcorner$ denotes $(\iota x)(\phi x)$ is distinct from the Independence Principle (as varieties of free logic will show) and does *not* entail $\phi(\iota x)(\phi x)$ (as neutral logic countermodels will show). The unqualified Characterisation Principle $\phi(\iota x)\phi \underline{x}$, which Linsky (mistakenly) attributes to Meinong (p.33, as well as p.34), is an exceedingly damaging principle, and contrary to Linsky (p.35) does lead to propositions of the form $p\ \&\ {\sim}p$. For consider the object $(\iota x)(Rx\ \&\ {\sim}Rx)$, a for short. Then, by the assumption principle, $Ra\ \&\ {\sim}Ra$.

There is no "ontological population explosion" under Meinong's theory: to suggest so is to misrepresent the theory. The identity *conditions* for objects are clear, even if, as in the case of existing objects, it is not always clear, or determinate, whether certain objects are the same or not. Since these ordinary identity principles provide an answer to questions, such as Linsky's about the kings, there certainly are principles which supply answers to such questions - and similarly theories of descriptions such as Russell's provide answers, even if wrong ones, e.g. the king of France = the king of China. In fact the king of France is Leibnitz distinct from the king of China, since someone can think of one but not the other; and a theory which gave a different result would hardly be reasonable. And on Linsky's assumptions about Meinong's theory, the two kings are presumably extensionally distinct since one is king of France and the other not (but of China): thus as they differ in extensional respects they are in fact distinct. Accordingly there is no solid evidence, on the basis of identity-conditions, that the notion of *object* is misapplied in Meinong's theory.

As with identity so for likeness and similarity, essentially the same accounts that apply to entities apply to nonentities, two items being alike if they have sufficiently many extensional properties in common. It is on this basis that we say that a dryad and a naiad are alike, and much more alike than a unicorn and a centaur. Thus some possible things are alike, but as in the case of entities, alikeness is in general not sufficient for identity. These points answer all Quine's alleged difficulties except those concerning the various men in the doorway. Briefly, the concepts of identity and distinctness, likeness and difference, are applicable to nonentities, and the criteria for their application are the same as in the case of entities. Hence too set-theoretical notions are applicable to nonentities as well as entities, and numerical concepts apply. As Locke and Leibnitz argued against the scholastics and Frege reiterated (50, p.31), various classes of possibilia can be counted and numbered. A non-actual man in the doorway belongs to the three element class consisting of Pegasus, Heracles and a non-actual man in the doorway (not as Frege's own theory, adopted in Quine's ML, would have it, to a one element class comprising the null set). Similarly, it may make good sense to ask 'How many objects of a given type have a given property?' even where some or none of the objects exist.[1] The main problem, not special to nonentities, lies in determining which properties the objects in question have.

Consider now a nearest open doorway, and consider an arbitrary fat man who never has existed, e.g. Mr. Pickwick. Ask whether Mr. Pickwick is in that doorway. The answer is, as a matter of observation, No. In literal contexts the answer is the same in the case of every other merely possible fat man. Hence the answer to the question 'How many (merely) possible fat men are in that doorway?' is: Zero. The same answer may be expected on more theoretical grounds. By a familiar, and classically accepted, thesis attributed to Brentano, a merely possible item cannot stand in entire physical relations, such as being in or standing in, to actual items. Hence merely possible men of any variety, fat or thin, bald or not, cannot stand in actual doorways. Thus the answer to each of Quine's numerical (how many?) questions is: Zero. There are zero possible men in that doorway, zero possible fat ones, and exactly the same number of merely possible thin ones.

The answers given to these last questions are, again, exactly those classical orthodoxy should supply, even if the reasons for the answers are of a somewhat different cast. Since classical orthodoxy has, with its very limited quantificational apparatus, serious difficulties in expressing its answers, let us articulate them for it. Since no nonentities exist, of whatever kind, there are exactly as many nonexistent fat men as thin men, namely none, so none can be standing in any actual doorways.[2] In short, classical orthodoxy can already supply answers to what are reckoned the hardest of Quine's questions - giving the lie to such charges as that identity, difference and numerical properties cannot be meaningfully attributed to nonentities, and so removing the ground for the further charges of disorderliness and incorrigibility.

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[1] Quine appears to be suggesting that such questions as 'How many possible fat men are there in that doorway?' make no sense, and, presumably, that corresponding assertions of the form 'There are n possible fat men in that doorway' are meaningless. For the question is significant if the corresponding indicatives are. And prima facie the indicatives are significant (and transformations can be used and arguments constructed which reveal that the sentences are significant): they contain no category or type mistakes. So they cannot be convincingly written off as not well-formed: even if they strike the uninitiated as odd they require logical accommodation. Accordingly such questions, and indicatives, are just as much a problem for classical logical positions as for the nonclassical positions they are directed against.

[2] On a popular alternative account, they are all identical with the null set (or entity), which does not stand in any actual doorways. The result is as before. But other accounts from out of the classical stables differ, e.g. Hilbert's theory supplies no answer, and even Russell's theory strictly applied gives no answer to those questions which include the adjective, 'possible'. Let it not be taken as an objection to nonclassical approaches, then, that different theories provide different answers to the questions.

3.0 MIXING NUMERICAL QUANTIFIERS AND MODALITIES

It is not easy to avoid the impression that one of the many reasons why Quine's questions have been thought to cause especially severe difficulties for Meinongian style theories is because 'A possible man is in that doorway' has been confused with 'A man is possibly in that doorway', that de re modalities have been confused with de dicto modalities (in one sense of that vexed distinction).[1] As the second claim, like the pure de dicto claim 'It is logically possible that a man should be in that doorway', is usually true for open unoccupied doorways (and let us suppose for the selected one such), if the conflation were correct the answer to the question 'How many possible men are in that doorway?' - now the question 'How many men are possibly in that doorway?' - would seem to be 'At least some' since Smart is possibly in that doorway, and the determination of the exact number would - on the doubtful assumption that it is determinate at all - become a knotty, though hardly "insoluble", problem. But the conflation is not correct: the sentences have different semantical analyses, the first stating a relation of being in in the actual situation whereas the second states such a relation in one possible world.

Part of the interest of Quine's question comes from the number of different answers it has been given by different philosophers, different answers induced partly by different theories of nonexistent objects and partly by different questions, not only the de re question we have so far been concerned with, namely

(1) How many merely possible (nonactual) men are in that actual doorway.
but also the questions:

(2) How many men are possibly in that doorway?
(3) How many men can possibly be in (be crowded into) that doorway?,
or, more precisely, what is the largest number of men that can possibly be in that doorway?

Question (2) splits into different questions according as the collective quantifier precedes or follows the modal operator, namely
(2a) Of what numbers n of men is it true that for those n men it is possible that they are in that doorway (together)?
(2b) Of what number of men is it true that it is possible that those men are in that doorway?

The answer to question (3) sets a bound on the answer to question (2). No doubt the answer to (3) is at least, Many, but a more exact answer depends on how small humans can be and what shape and how large the doorway is (and also on the type of modality). The answer to (2b) is then: any number between zero and the bound. For let k be any such number: then the statement "it is possible that k men are in the doorway" is true. Accordingly the best answer to (2) is: it is indeterminate,[2] though the indeterminacy is bounded.

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[1] According to Lewy (76, pp.32-6) Quine does confuse de re modal statements with de dicto modal statements. Unfortunately on the point of issue it is perhaps Lewy who is confused.

[2] This is the answer to Quine's question arrived at in the original version of EMJ1. It now appears to be an answer to a different, if easily confused, question, namely (2b).

3.0 PARSONS' ANSWER TO QUINE, AND PARSONS' DOORWAYS

Without doubt some conflation of modalities is encouraged by ordinary discourse. Consider, for example: 'Some cloud and a possible thunderstorm are forecast for Canberra this afternoon', where the apparent de re modality has an intended de dicto expansion. A confusion of modalities also seems, at first sight, to occur in Parsons' answer to Quine (74, p.572):

> ... when Quine asks about "the [merely] possible fat man in the doorway", he uses a definite description which, on this account [because the uniqueness clause is not satisfied], fails to refer - for there are many possible fat men in the doorway.

It is logically possible that many fat men are in the doorway, but it would be quite invalid to infer that many possible-fat-men are in that actual doorway - nor does Parsons' analysis support such a claim.[1] For properties such as those of possibility and actuality figuring in the interpretation of 'possible fat men' and 'actual doorway' are (in the intended sense) extranuclear, and so are not characterising. But what has been said is not what Parsons means. There is an ambiguity in 'possible fat man', depending on whether 'possible' goes into the description, as supposed above, or not, i.e. is regarded as consequential. On the latter construal, there are on Parsons' theory infinitely many possible fat men in that doorway (indeed the cardinality is presumably nondenumerable), one for each consistent set of nuclear (i.e. roughly, characterising) properties which includes at least the properties of being a man, being fat, and being in the doorway.[2] Infinitely many, irrespective of the size of the fat men, and that some of them will be giants who fill the doorway or more! The result is implausible (deeper reasons for dissatisfaction with, and ultimate rejection of, Parsons-style accounts will be presented in the final chapter).

It is bound to be objected that any Meinongian-style theory will generate many, very many, possibilia standing in that doorway. Consider the n possible fat men standing in that doorway, for an arbitrarily selected number n. Then surely, by the Characterisation Postulate, some n possible fat men are standing in that doorway? Emphatically, No. The postulate has only a carefully restrained role on any theory that can claim coherence:

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[1] Parsons' other answers to Quine's "embarrassing" questions (74, note 21) are just fine (and happily in agreement with mine).

[2] And as one may admit for Parsons doorways, Parsons doorways being the doorways of Parsons' theory and having properties supplied by that theory. That is, a Parsons doorway is like Holmes' London - only the source book for such an object is Parsons' theory, not the requisite group of Sherlock Holmes stories. There are many interesting questions one can ask, and answer, about Parsons doorways, e.g. Do any exist? The answer is No; for if one did a merely possible object could stand in entire physical relations to an entity, contravening the Brentano thesis. Could an existing object, e.g. Parsons, stand in a Parsons doorway? On Parsons' theory the answer is Yes, given that Parsons is fat enough (in fact a Parsons doorway will, on the theory, contain as many existing fat men as are standing in the given doorway). But, in fact (i.e. on the theory here elaborated), the answer is, again, No; for Parsons would stand in the doorway along with, and next to, various merely possible objects, again contravening Brentano. However Parsons' Parsons, i.e. the set with exactly Parsons' nuclear properties could be in a Parsons doorway (e.g. in the world of Parsons' theory); but now the Brentano thesis is not violated, for, in particular, the set correlated with Parsons does not exist.

it does not (at least in the noneist theory advanced) warrant ontological arguments or the like, or the establishing of new entire relations between what exists and what is merely possible. Nothing, of course, stops the design of (generally less satisfactory) theories with more sweeping Characterisation Postulates. Some of these theories would, like Parsons' theory, give different answers to some of Quine's questions. This is unsurprising, rather as it is unsurprising that different classical-style theories identify Pegasus with different objects, or admit different universes of sets.

A rather similar reply can be made to the related objection that we can tell stories which describe fat men in the doorway. A tells one story with 3 fictional fat men fitted into the doorway. B out-does A and tells a tale in which 10 fat men are squeezed into the doorway. C tells an even taller tale ... . How many fat men are in the doorway? On A's story 3, B's 10, and on C's tale, 98 say. But in reality, as before, 0. For the world of A's story is not the real world. No assumption postulate applies: we cannot directly determine such characteristics of the real world as what stands in actual places by storytelling.[1] For these reasons too Rescher's answer (in 68) to Quine's how many questions, namely, 'As many as are described', is inadequate (Rescher's answer is a much better answer to question (2) above, which may be the question Rescher intended to answer). Each of A, B and C describe different numbers and not all can be right, since 3 men differ from 98. That is, different, and inconsistent, descriptions may be given, and different, and inconsistent, riders may be added at a later time. Moreover descriptions are not the only way of specifying possibilia; they may, for example, be inferred from a theory. That the storytelling-assumption line cannot be right emerges more clearly if the storytellers use actual fat men in their accounts, e.g. A's story is about Herman Kahn and two other modern Falstaffs. A story about actual figures does not make that story true, except in appropriately indicated fictional contexts. As it is with entities, so also it is with nonentities.

In fact some of the differences between entities and nonentities have been much exaggerated, especially by the enemies of the nonexistent, empiricists and idealists alike.[2] For nonentities are not as chaotic, as indeterminate, or as lacking in independence as they have been represented as being; while at the same time entities are not as totally independent, as free of indeterminacy and vagueness as has been made out. The following cloud parody, which can be reworked for a great many other natural entities, is intended to draw out these points:

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[1] This is part only of a larger story concerning the truth of fiction and storytelling. Of course it is true that Mr. Pickwick wore gaiters, that Sherlock Holmes lived in London, and that phlogiston is a heat substance; and it is true that James Bond stood in, or at least passed through, various doorways; and this need not conflict with the fact that no such objects exist or ever existed. The reconciliation is, as chapter 7 tries to explain, in the first place, by way of contextual differences - fictional statements are contextually intensional - in the second and associated place, by way of duplicate subjects, e.g. Bond stood in the doorway depicted in the film (which is true iff, in the world of the film, stood in the given doorway), and, in third and most important place, through reduced relations.

[2] Of course, when it comes to attempts to discredit nonentities, the reverse happens: features of entities, such as unqualified reliability, are inappropriately transferred intact to nonentities.

> ... The slum of entities is a breeding ground for disorderly elements. Take, for instance, the cloud in the sky above; and, again, the adjacent cloud in the sky. Are they the same cloud or two clouds? How are we to decide? How many clouds are there in the sky? Are there more cumulus than nimbus? How many of them are alike? Or would their being alike make them one? ... is the concept of identity simply inapplicable to clouds? But what sense can be found in talking of entities which cannot meaninfully be said to be identical with themselves and distinct from one another? These elements are well-nigh incorrigible ... I feel we'd do better to clear the slum of entities and be done with it.

And so to parody Kenny also: these objections make untenable the notion of an entity. However, what should be removed is not the slum of entities and nonentities, but the classical logical economy which has reduced these solid dwellings to slums.

There are several corollaries and further points. Firstly, many of the problems that are taken to be insuperable in the case of nonentities arise equally in the case of entities, especially natural objects such as clouds and storms and waves, mountains and waterfalls and forests. But the problems are not usually seen as - and should not be seen as - discrediting entities. Thus a double standard is being applied. Questions which are realised not to present insuperable problems for entities are taken to do so in the case of nonentities, which are required to be determinate, distinct, and so on, in a way that entities are frequently not. But recall all the decision questions for entities that Wittgenstein and Wisdom introduced us to (see especially Wisdom's neglected 53), and add some more, e.g. How wide is Mt. Egmont? Where do its slopes end? How long is a leech? How long is Plato's beard? Is this a new wave? How many mountain peaks are in the range? Questions as to precise boundaries, in particular, are very common with natural entities: these are sometimes settled by decision or convention, and sometimes not. Sometimes they call only for cheerful indecision.

An upshot is that common philosophers' paradigms of entities and their resulting pictures of the universe (of entities) need adaptation or, better, replacement. The paradigms of entities have too often been artifacts such as furniture and office equipment which, because human artifacts, do have sharp boundaries and determinate numerical properties, in contrast to natural objects, which frequently, in advance of specific decisions, do not. The paradigms have encouraged dictums, such as Quine's 'No entity without identity' designed (unsuccessfully) to rule out such things as attributes, which seriously applied exclude many natural objects as entities. It is the dictums, not the entities, that have to go. Also to be rejected as decidedly misleading is the familiar philosophers' picture of entities as the 'furniture of the universe'.[1]

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[1] For an elaborate recent sketching in of this misleading picture, see Findlay 63, pp.328-9, on 'the universe's undeniable furniture', much of which does not exist. See too Bunge 77, Ontology I. The Furniture of the World, Reidel, Dordrecht, 1977.

Why has the Identity Problem been thought to be so severe for nonentities, far more problematic than for entities. There are a number of different sources for identity anxiety, and in order to see where the sources of anxiety lie it is important to separate out these different sources for the alleged Problem. Several different aspects of the noneist theory are relevant to deal with the different sources. Thus some anxieties are resolved by use of indeterminacy, some through the theory of extensionality and identity in intensional frames, and some by making use of features which come from the Characterisation Postulate. There are at least these cases:-

1. Anxiety arising from indeterminacy of identity. Some identity claims concerning nonentities are indeterminate, e.g. which of the various Faustus's of the literature are the same. From this point of view identity is simply on a par with other features of nonentities. It is felt however that this reveals an arbitrariness and perhaps chaoticness about nonentities because the property in question, namely identity, is a logical one. It is felt that the fact that some identities concerning nonentities are indeterminate makes nonentities unsuitable objects for logical treatment. This is not so, any more than it is so in the case of entities. It is simply that a satisfactory logical treatment will have to allow appropriately for indeterminacy. Further, this particular sort of worry should be resolved once indeterminacy and the way it is treated are grasped; and in fact it should be seen as a superior feature of a theory that it can take up and explain the data on which the anxiety is based, rather than simply using it as a reason for rejecting nonentities as outside the scope of a logical theory.

2. Several worries derive from the issue of criteria of identity for nonentities. The first worry arises because no distinction is made between contingent and necessary identity; it is assumed that identity relations between nonentities must be necessary identities (e.g. identity of concepts), giving rise to the mistaken charge that nonentities are nothing but concepts, and thereby making them unsuitable for intensional analysis and sacrificing much of the very substantial point of having nonentities for intensional analysis (on this see chapter 8). That the assumption is mistaken should be evident from elementary contingent identities, such as 'Pegasus is what I am thinking about'. Necessary identity is rightly perceived as generating serious problems, but the options are not perceived. The difficulties are resolved by the theory of extensional identity (as explained in SL and in chapter 1), which applies to nonentities just as to entities. Then 'no therapy of concepts' is required for the rehabilitation of nonentities (p.4); nor is such a reduction at all desirable.

A worry remains. It is thought that one cannot have contingent identities between nonentities because this is identity of reference and in the case of nonentities there is no reference to be identical. This problem is resolved (in the theory of identity) by distinguishing identity of reference from extensional identity, that is identity over extensional properties. Referential identity, which can only apply truly to existing items, is defined in terms of coincidence of entities in extensional respects: it is extensional identity of entities. Thus if a and b are referentially identical 'a' and 'b' have interchangeable referential occurrences.[1] Since expressions about nonentities have no referential occurrences in true statements, nonentities cannot have identity of reference. But they can still be extensionally (or contingently) identical, since they have extensional properties, and extensional identity of nonentities is coincidence of extensional properties.

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[1] For a referential occurrence of a subject both existential commitment and referential transparency are required. And then truth can be assessed entirely in terms of the reference. According to the Reference Theory all genuine subjects occur referentially.

3. Perplexity arising from failure to see that nonentities can have extensional properties, with the result that it is thought that any two of them must be the same. The worry is resolved through assumption, in particular through the Characterisation Postulate which assigns extensional features to nonentities on the basis of their characterisation.[1]

4. Anxiety arising from the failure of nonentities to have distinctive identity criteria, different from those for entities. For example, Lambert (in 76, p.252) seems to think that each sort of item should have its own distinctive identity criteria. This need not be so. Different sorts of items (e.g. possibilia and impossibilia, or properties and intensional sets) may have the same identity criteria and yet be distinguished by other features, e.g. the assumption of existence leads to inconsistency in the case of impossibilia but not of possibilia, and sets differ categorially from properties in such matters as being able to have members.

Quine suspects 'that the main motive for including nonentities in the domain of discourse is to escape the riddle of non-being' (p.4; also 59, p.202); but since that riddle can be satisfactorily disposed of, so he thinks, by way of Russell's theory of descriptions without appeal to nonentities (p.8; also 59, p.202), there is no need or ground for such expansion of the discourse domain. According to noneism he is wrong on both counts. Firstly, the Meinongian and noneist solution to the riddle is an incidental, and pleasing, by-product of a theory designed primarily for, and from, the analysis of intensional discourse and discourse about what does not exist (see chapters 1 and 2 in particular). Secondly, Russell's theory of descriptions is inadequate for such a task; for it sometimes delivers the intuitively wrong truth-value assignments. For example, it is true that Meinong thought that the round square is square, but whatever scope it is given on Russell's theory of description it nevertheless gets wrongly assigned value false. A somewhat different counterexample to the theory is the following truth: If the winged horse Pegasus does not exist I can nevertheless think of him and be aware that he is winged.

Noneists have no taste for grossly impoverished discourse - which is what Quine's taste for desert landscapes (p.4) comes to - yet find no convincing case for populating the domain of reality with a profusion of abstractions such as sets in their transfinite multiplicity - after the fashion of Quine. (Indeed one has the feeling from Quine's work that there is no case for admitting that such objects as sets exist, except that the immensely important enterprise of scientifically essential mathematics could not get along without their existence. But, somewhat rewritten in neutral form, it can.)

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[1] Or through equivalents on other theories e.g. through the fundamental (assumption) postulate of Parsons' theory which assigns to each nonentity all nuclear properties of its characterising set.

Quine's discussion of the ontological problem of universals in FLP is much less detailed in argument and less conclusive than his discussion of the problem for particulars. The noneist critique of Quine which follows will be correspondingly more doctrinaire and less detailed in arguments for the claims advanced. The noneist thesis is, in direct contrast to M^cX, that there are no such entities as attributes, relations, classes, numbers, functions, propositions and the like: none of these exist, in any sense. Even so, some items are attributes, others are numbers, and so on; and these nonexistent items play an important, and sometimes essential, role in discourse and can have a major explanatory role. Such a position, anathema to most empiricists, Quine tries, in effect, to rule out as not even an option. In this he is less than successful, as we shall try to show.

Quine's main move is to try to foist upon us a criterion of ontological commitment in terms of use of bound variables. The argument is hardly compelling. While it is true that we can easily involve ourselves in ontological commitments, i.e. commitments to the existence of certain things, by maintaining (saying is not enough) that there exist such and such things, this is not the only way in which ontological commitments can arise, nor need nonexistential quantification commit us ontologically. Quine contends, however, in an inference which looks remarkably like an A-conversion, that 'use of bound variables '...' is, essentially, the only way we can involve ourselves in ontological commitments' (p.12). On the face of it this contention is just false: someone who maintains that such and such thing exists commits himself just as much as someone who maintains that there exist such and such things. Quine's further argument (pp.12-13) is that the eliminability of names and descriptions shows that names, and descriptions, are 'altogether immaterial to the ontological issue'. Even were names and descriptions eliminable, the argument is invalid: the support is irrelevant. For 'exists' is a referentially transparent predicate, and the paraphrasing of 'Pegasus', for example, as 'the thing which pegasizes' does nothing to eliminate the commitment but simply rephrases it. That Pegasus exists (or does not) remains true because it is true that the x which pegasizes exists (or not). In symbols, $p = \iota x p(x) \supset. \iota x p(x)E \supset pE$. It is similar with the eliminations of descriptions. Because $xE \equiv (\exists y)(x = y)$ and $xE! \equiv (\exists ! y)(x = y)$ we can quite evidently involve ourselves in ontological commitments by way of names and descriptions if we can so involve ourselves through use of bound existential variables. And all the fact that languages shunning names can be designed shows is that in such languages we would lack primitive expressive means of stating ontological commitments through names. In itself this shows nothing about the statements of such commitments in languages which are not so lacking in expressive power. The conclusion is accordingly that Quine's claim as to bound variables being the only way we can involve ourselves in ontological commitments is false.

Nor does the use of quantifiers and bound variables always involve us in ontological commitments: the use of nonexistential or existentially-neutral quantifiers does not (as SE and SL argue). Use, for example, of the neutral quantifier 'something' (which expands to 'for some object x...') as in the claim 'Something does not exist' in no way commits the claimant to the existence of anything ('anything' can also be used neutrally here). The appealing equation 'to be assumed as an entity is, purely and simply, to be reckoned as the value of a variable' (p.13) is as false as it is simple.

Unfortunately the false criterion pervades much of what Quine has to say about ontology and ontological problems, and renders it unacceptable. This applies in particular to what he has to say about the ontological commitments of conceptual schemes and about the problem of universals. The result in the case of the universals problem is that the noneist positions, according to which we can talk quantificationally about universals though none such exist, is entirely excluded (for more details of such a position, see Routley[2] 75 and chapter 8). And the separation of neutral quantification from existence, as in noneism, removes what basis such assertions as the following may have had:

> One's ontology is basic to the conceptual scheme by which he interprets all experiences, even the most commonplace ones. Judged within some particular conceptual scheme ... an ontological statement goes without saying, standing in need of no separate justification at all (p.10).

A noneist conceptual scheme, or theory, may include notions such as those of time and number, which items are definitely not assigned existence, and others where the question of existence is unknown or left open. (And even on Quine's view the latter can happen so long as quantification is eschewed.) Ontology is not so basic after all. For similar reasons fixing upon an overall conceptual scheme does not (contrary to Quine's claim on pp.16-17) determine an ontology.

Quine attempts to use the relativity of conceptual schemes, and of what he takes to be the automatically associated ontology, to dispose of positions on universals like M^{c}X's (p.10). But the rival scheme Quine sketches is hardly very compelling, and the serious weakness of some of his points becomes apparent if the working example is changed from redness to, for instance, brittleness or solubility. Brittle things have nothing in common 'except as a popular and misleading manner of speaking'? The ground for assessments of brittleness extends no further than actual things that are brittle? Properties such as brittleness have no 'real explanatory power'? Even more surprisingly, predicates such as 'is red' and 'is brittle', though meaningful, have no meaning! In 'refusing to admit meanings' Quine has thereby deprived himself even of the usual semantics for applied quantificational logic which interprets predicates through universals, either attribute- or set-theoretically. M^{c}X, presumably, was not impressed by Quine's attempt to cool down the hot spot he put himself in with his vaunted rejection of meanings, and nor are we. Meaning does not reduce, as Quine hopes we'll allow, to sameness of meaning unless, what is at issue, attribute abstraction is also allowed; but given abstraction, through which meaning can be recovered from sameness of meaning, redness can be retrieved from things being red, and so on. Quine no doubt hopes we'll allow too that 'what is called giving the meaning of an utterance is simply the uttering of a synonym'; but this (pre-Wittgensteinian suggestion) is a total travesty of the range of things that would count as giving the meaning of an expression, some of which would consist in pointing to an appropriate universal.[1]

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[1] Findlay makes a similar point (63, pp.325-6): 'That we often discuss the sense of expressions by equating them with other expressions is of course undoubted: it remains true that the expressions with which we equate them must be understood, and understood in that peculiar restrictive fashion which amounts to isolating their sense'.

3.0 MYTH IN QUINE, THE DISAPPEARANCE OF TRUTH AND OF MUCH UNEXCEPTIONAL DISCOURSE

When it comes to the universals of mathematics and physical science, as distinct from those of commonsense, Quine's attitude suddenly changes. The 'higher myth' of numbers and classes 'is a good and useful one' (p.18). Truth has vanished: in trying on one or other conceptual schemes or associated myths, we are only selecting what is simple, economical, useful and serves our various interests or purposes. Important issues among the problems of universals have been lost sight of, such as, what is true in classical mathematics, and which, if any, of the claims made as to the existence of universals, how much of classical mathematics is myth (and how precisely is this analogy cashed out) and how much can be redeemed. Don't anticipate clear answers on such issues in FLP.

Quine supposes that the intermediate and upper ramifications of his conceptual scheme will enable him to communicate successfully, e.g. with M^{c}X, on such topics as politics, the weather, and language (p.16). Given Quine's assumptions as to what can be significantly said and the severe limitations of his conceptual scheme, this should strike one as extremely doubtful, and certainly as nowhere substantiated. Weather forecasts, for example, are frequently decidedly intensional and exhibit remote grades of modality: the intensional assessment of such forecasts, as discussion of the weather may involve, strikes the less credulous among us as even further beyond the pale of legitimate Quinean discourse and admissible myth.[1]

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[1] We find much else, of less immediate noneist relevance, to disagree with in Quine's essay, especially in the last pages. We don't agree, for example, with the unsupported claim (p.19) that the phenomenalistic conceptual scheme 'claims epistemological priority'. (The reasons for not agreeing include those Austin has given in 62 and those introduced in the analysis of phenomenalism in the later part of chapter 8.) We certainly don't agree that 'we adopt, at least insofar as we are reasonable, the simplest conceptual scheme into which the disordered fragments of raw experience can be fitted and arranged' (p.16). That is a slick, and on reflection obnoxious, pragmatico-empiricist reslanting of what is accounted reasonable. Raw experience is not all that has to be accounted for, and truly accounted for. Much depends too on whether or not "fitting" is forcing.

CHAPTER 4

FURTHER OBJECTIONS TO THE THEORY OF ITEMS DISARMED

Theories of objects and items have been - and no doubt will continue to be, so long as they clash with philosophical orthodoxy - subject to a barrage of criticism and objections, often hostile. Some of these are alleged to be fatal or very serious and to show that any theory of objects which do not exist, and certainly of impossible objects, is incoherent in one way or another, or even completely unviable, or involves severe conceptual confusion. Others of these are alleged to show, what is different, that any such theory is otiose or at best uninteresting or not really worth considering Many of these objections have been made in connection with Meinong's theory of objects. At this stage some of these objections may seem naive; but they are so frequently encountered that they require exposure.

It should come as no surprise that many of the allegedly "commonsense" objections, which are supposed to demonstrate the complete unviability of theories of items, are based, in one way or another, on the Reference Theory, or its components. In such cases it is enough to bring out this fact; for the Reference Theory and its components have already been criticised at length. In the long run the choice between the Reference Theory and other theories must rest on which theory provides the best explanation of the data. But in the meantime, it is methodologically objectionable to discount rivals of the Reference Theory on the ground that they fail to conform to the Reference Theory, especially when the Reference Theory has shown itself so singularly unsuccessful in accounting for the data, and so capable of generating gratuitous philosophical problems.

There is also another striking feature of many of the objections: either nonentities are expected to behave like, what they are not, entities, or else nonexistent objects and theories of them are expected to measure up to standards that are rarely or never met in the case of existent objects or theories of them.

Russell's famous objections to theories of objects, that certain objects are apt to infringe the law of noncontradiction and that the theories engender ontological arguments, have already been neutralised (by use of predicate negation and a division of properties); and Quine's well-known problem questions concerning nonexistent objects have been answered. But much remains to be done, for many other objections have been lodged. In what follows all the usual objections to theories of objects to be found in the literature (that have not been assessed in earlier chapters) and other objections as well - indeed all that have so far been encountered that have any plausibility - are considered and, hopefully, disarmed.

§1. *The theory of objects is inconsistent, absurd; Carnap's objections, and Hinton's case against Meinongianism.* It is commonly objected that any general theory of nonexistent objects is absurd, because contradictory. Husserl, for example, attempted to prove to Meinong that the notion of a nonexistent object is absurd: all that he really proved, however, according to Chisholm (68, p.374), is that it is absurd to suppose that there are nonexistent objects. In fact, Husserl did not even prove this much, unless 'are' is existentially loaded (i.e. is 'are^E'), but only that it is logically impossible that nonexistent objects exist. A simple neutral quantificational model shows that Meinong's famous statement (in TO, p.83, but without the loading shown) 'There are objects of which it is true that there are^E no such objects', more succintly 'Some objects are such that they do not exist' is consistent and leads to no absurdity; and a modal elaboration of the modelling will then show that what Meinong said is logically possible.

The assumptions of the Reference Theory, that all quantifiers are existentially loaded, that all discourse is at bottom Sein discourse, not only lie behind Husserl's alleged demonstration of the absurdity of any theory of nonexistent objects, but are at the base of Russell's contention (05, 482 ff.)[1] that any theory that admits inconsistent objects is inconsistent, a contention given qualified endorsement by Carnap (56, p.65):

> Russell is certainly right in the following respect: Within the logical framework of our ordinary language, we cannot consistently apply the conception of impossible things or even that of possible nonactual things.

This is entirely mistaken: in natural language we can, and do, talk about nonexistent items (as we have seen by way of many examples), and elementary fragments of this discourse - which admit of consistent extension - can be shown to be consistent. What is Carnap's basis for conceding ordinary language, in effect, to the Reference Theory: empirical investigation? No, else he would have begun to find out that the claim is mistaken. Carnap has, as his arguments indicate, made the mistaken assumption that all ordinary discourse is referential, in Meinong's terms consists entirely of Sein statements. Carnap argues that any language accommodating nonentities

> must be different from the ordinary one [as] is shown by the following example: In the ordinary language we say: 'There are no white ravens and no round squares'. In the new language we would have to say, instead: 'There are white ravens; however they are not actual, but only possible. And there are round squares; however, they are neither actual nor possible, but impossible' (56, p.65).

Several things are wrong with this argument. To begin with it does not establish its point, since the sentence, 'There are no white ravens and round squares', can be perfectly well expressed in the formalism of the theory of objects using existential quantifiers (and moreover its equivalence to 'No white ravens exist and no round squares exist' - something classical theory cannot express directly - can be shown). Nothing prevents the use of existential quantifiers, as well as neutral quantifiers, in the theory of objects, just as nothing prevents the theory's catering for Sein as well as Sosein statements. Indeed in these respects the theory simply reflects ordinary language which likewise includes both sorts of quantifiers and caters for both Sein and Sosein statements. It may be (and certainly is in the case of extensional discourse) that existentially loaded discourse such as 'There are^E no white ravens', can be paraphrased - in terms of wider quantifiers (though not in Carnap's way, since the claim says nothing about white ravens being possible objects) - in the example as 'It is not the case that some items are white ravens and exist'. But that in no way shows that we have to use the paraphrase: most English can be translated into German but we don't have to speak German.[1]

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[1] Russell's commitment to this contention is further discussed in the next chapter.

Elementary modellings of the sort that vindicate Meinong against Husserl's charges (e.g. the models of SE) at the same time dispose of the naive inconsistency objection that any theory of objects is inconsistent because it implies that there are things that do not exist, which, it is said involves a contradiction: 'to say that something does not exist, or that there is something which is not, is clearly a contradiction in terms' (Quine ML, p.50). A contradiction only results however upon reading the neutral quantifier 'some' or 'there are' existentially, upon conflating "Some things do not exist" with "There exist things that do not exist".

An alternative argument, which depends not on the mistaken identification of the particular quantifier 'there is' with the existential quantifier 'there exists' but on direct application of the principle of existential generalisation, goes this way: Since 'Pegasus does not exist' is genuinely about Pegasus according to the theory of items, Pegasus must be a genuine logical subject open to quantification; but then it follows, by existential generalisation, that there exists something that does not exist! Unfortunately for the argument the particular quantifier 'P', 'for some', of the theory of items is logically distinct from the existential quantifier '∃', 'there exists'; and though the principle $(\exists x)A \rightarrow (Px)A$, i.e. there exists an x such that A implies that for some x, A holds, its converse is certainly not valid. Thus too, though the principle (of PG), $A(b) \rightarrow (Px)A(x)$ is valid for every subject 'b', this in no way underwrites the principle of existential generalisation (EG), $A(b) \rightarrow (\exists x)A(x)$, which is not generally valid, and to which, as we have seen, counterexamples abound.

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[1] Carnap has an auxiliary argument which, if correct, would show that Sosein statements (and nonreferential claims) rarely, or never, occur. According to Carnap, both Meinong and Lewis mistakenly apply their distinctions

> to objects and thereby violate the rule of ordinary language which takes the addition of 'actual' to a general noun as redundant. For example, the ordinary language takes phrases like 'actual horses', 'real horses', 'existing horses', etc., ... as meaning the same as 'horses', differing from this only in emphasis; and, likewise, 'actual axioms' is taken as meaning the same as 'axioms' ... (65, p.67).

There is no such ordinary language rule; the adjectives 'real', 'actual', and 'existing' are often not redundant, as examples of nonreferential occurrence of subjects in particular show. Thus 'Pegasus is a horse' is not (materially) equivalent to 'Pegasus is an existing horse', 'Meinong believed the round square is round' is not equivalent to 'Meinong believed the actual round square is round', 'Unicorns are one-horned' is not equivalent to 'Real unicorns are one-horned'. In any case, 'real', 'existing' and 'actual' have different robs even in referential uses. 'Real', for example, unlike 'existent', contrasts with 'artificial', in 'Are these real diamonds?' - another nonredundant use. On the real

(Continued on next page)

It is not just that nonreferential quantifiers like 'P' can be consistently introduced as part of a coherent theory; contrary to Reference Theory propaganda, nonreferential quantification is a frequent, and important, phenomenon in ordinary language, especially in quantification into intensional contexts. In fact quantifiers, like 'P', which carry no commitment to existence, are a rather inevitable outcome of the admission of nonreferential occurrences of subjects. For then the variables of quantification will hold places for nonreferential as well as referential occurrences. Since the value of a variable on which a generalisation step is based may in fact be a nonreferential occurrence, only generalisation with quantifier 'P' is always admissible; generalisation to an existential quantifier can only be adopted where what is generalised upon, the constant or value of the variable, occurs referentially.

In fact wide deployment of the EG principle is yet another way of insisting on the Ontological Assumption. Existential Generalisation is used to argue to the Ontological Assumption as follows: If, for example, it can truly be asserted that a round square is round, then by EG (given 'a round square' is a logical subject) there exists something that is round. But what is this something that exists? It is a round square. Therefore a round square exists. Generally by the same argument, if x has a property then for some predicate 'f', xf is true; and so $(\exists y)yf$. What is this y which exists? It is x. Hence x exists. The argument is circular. For one is only entitled to use EG if the subject does exist. One can't first use EG, and then conclude, since one has, that the subject exists. What is correct is not EG but only PG and the free logic principle: '$xf \;\&\; xE \rightarrow (\exists y)yf$. The only logical moves that are generally applicable without qualifying premisses, such as that an item exists, are those that are common to both referential and nonreferential occurrences. These form the basis of a neutral logic, with neutral quantifiers such as 'P', and '~P', 'for no item'. Within this neutral quantification logic it is a routine matter to show up equivocations and slides between referential and non-referential uses of such quantifiers as 'something' and 'nothing' - examples abound. Consider one conspicuous recent example.

In a very brash stroke, Hinton writes both the Ontological Assumption and Existential Generalization into his discussion of what he calls 'Meinongianism': for example (72, p.99)

> We can independently say that whether the Meinongian likes to think so or not, he is in fact claiming that there exists in Russell's quantificational sense a golden mountain, since he is claiming that at least one object of reference has a property of golden-mountainhood.

As regards genuine Meinongians, what Hinton claims is seriously mistaken, on both historical and factual counts. Hinton's attempt to rubbish Meinongian systems begins with, and depends crucially upon, an error as to the intended

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[1] (continuation from previous page)

complexity of 'real', see (but on one's guard) Austin 62, pp. 64-76.

In addition, the principle which in certain cases (referential contexts) admits the addition of 'existing' without upset, is not a syntactical one but a contextual principle.

meaning of Russell's existential quantifier '∃'. Hinton objects to Chisholm's argument that

> Russell's theory of descriptions presupposes the wrongness of Meinong's theory ... for Russell's theory of descriptions requires us to interpret 'the golden mountain is golden' as meaning among other things that there exists a golden mountain.

on the (astonishing) ground that Russell's theory does not require the latter existence claim. Hinton's case is that

(a) 'Russell does encourage us to think of '∃' as saying 'there exists', that 'is his philosophical view', but

(b) Russell's quantifier '∃' does not mean 'there exists', but reads neutrally 'there is at least one' or 'for some', and so captures exactly Meinong's nonexistential quantification (es gibt).

Unfortunately for Hinton's case Russell's post-1905 work contains no such separation of quantifiers, 'there exists' and 'there are', and accordingly does not include a neutral quantifier in terms of which Meinong's claims can be captured. Consider, what is perhaps definitive of the meaning Russell intends to assign to '∃', the statement of PM*9, p.127:

> We shall denote "ϕx sometimes" by the notation $(\exists x).\phi x$. Here "∃" stands for "there exists", and the whole symbol may be read "there exists an x such that ϕx".

In a similar vein, it is said 'the symbol '$(\exists x).\phi x$' may be read "there exists an x for which ϕx is true"' (PM, p.15), and 'An asserted proposition of the form "$(\exists x).\phi x$" expresses an "existence-theorem", namely "there exists an x for which ϕx is true" (PM, p.20). Since Russell's theory of descriptions is formulated in terms of '∃', Chisholm is right and Hinton wrong as to Russell's existential construal of 'the golden mountain is golden'.

What is happening in Hinton's attempt to foist the Ontological Assumption and Existential Generalisation on the Meinongian should now be clearer. Consider Hinton's summary (p.101):

> in a nutshell: the Meinongian holds that (∃x) (x is a golden mountain), where the quantifier has its standard meaning; ...

On a straight factual count this is false. The standard meaning of the existential quantifier '∃' is that given by Russell, 'there exists' (see virtually any of the standard textbooks), but the Meinongian does not hold that there exists a golden mountain. Of course, with a neutral quantifier 'P', corresponding to that of Hinton's case, part b), some Meinongians would hold (Px)(x is a golden mountain); but that in no way warrants the slide to unacceptable (∃x)(x is a golden mountain), where the quantifier has its standard, Russellian meaning. A corollary is the collapse of Hinton's case for his thesis (p.102) that

> the task of constructing a new logic, in which Meinongian and Anselmian arguments can be formalised to the extent necessary for their appraisal, is imaginary. We already have such a logic -

dear old ordinary Russellian logic. All that is true in Hinton's thesis is that classical quantification logic can be satisfactorily *reinterpreted* neutrally: but further important parts of Russell's logic, such as the theory of descriptions, cannot be.

But let us concede Hinton his nutshell claim for the *non*-standard quantifier 'P', in order to see how his arguments against Meinongianism fare.[1] The main arguments when stripped to basics are rather pathetic; for they amount to little more than the following shift in onus of proof: Meinongian claims 'are unwarranted, because they need a good ground and have none' (p.105; repeated, with a little embroidery, p.107). But there are excellent grounds for such claims. Take (from §1.4) any counterexample $\underline{\xi f}$ to the Ontological Assumption, e.g. 'The winged horse is believed by Parsons to be winged', 'Pegasus is self-identical according to free logic', 'Zeus does not exist'; then particularise, to get $(Px)xf$, e.g. 'There is at least one object such that--'. Given his logic Hinton can hardly object to particularisation (his EG), the usual point of resistance. Thus, as there is good independent evidence for the truth of the claim of "Zeus does not exist", there is good evidence for the Meinongian claim that there is at least one object that does not exist.

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[1] Hinton, although he frequently gives the impression that he is rejecting all (uncompromising) Meinongianism, e.g. in his parting suggestion that any system that is Meinongian ought to be rejected as such - directs his arguments against what he is pleased to call 'resolute Meinongianism'. Resolute Meinongianism is intended to capture, the last pages of Hinton's article indicate, Meinongianism which does not disappear under analysis or paraphrase. But Hinton's "resolute Meinongianism" is neither necessary nor sufficient to the task. An exponent of the contextual theory of fictions explained in chapter 7 would be a resolute Meinongian, having statements like "Something is a flying horse" true in a world of myth, without being committed to central Meinongian theses. Conversely, such Meinongians as Parsons and myself, are not 'resolute' in Hinton's sense because not prepared to accept his suggestions *One* and *Two*, to the effect some Meinongian statements are 'true only in the realm of myth'. Both 'only' and 'in the realm of myth' are objectionable. According to some Meinongians both 'Some thing is a flying horse' and 'Some object is round and square' are true simpliciter; and neither true in the realm of myth nor true only there. The position here adopted is that truth just is truth simpliciter, that expressions of the form 'true in this or that world or realm' are misleading and best avoided. Hinton's account of when a system is Meinongian is similarly defective, since defined in terms of resolute Meinongianism.

In fact none of these defects is material to the main issue, because Hinton's arguments against Meinongianism do not depend essentially on his notion of "resolute Meinongianism". Accordingly the main text is not burdened with the latter bit of technical jargon.

Hinton does outline one supplementary argument for his rejections of Meinongianism (and simultaneously exhibits his real predeliction for the standard existential quantifier, and his prejudice in favour of the actual) in his 'curt' criticism of the perennial philosophical idea from which Meinongian claims are, he thinks, often derived, namely 'the idea that a meaningful description is the same thing as a description to which something answers' (p.107).[1] The 'grim consequences' of this idea are, according to Hinton, firstly, that we are always wrong in seriously saying 'Nothing whatever answers to that (perfectly meaningful) description', and, secondly, that '"talking about things that do not exist" could not after all consist in using, in the grammatical subject position, a description to which nothing answers' (p.107). Neither of these consequences ensues, however, given the distinction already observed - that Hinton has been trying to plaster over - between existential and particular quantifiers. Simply represent the critical quantifier 'nothing' in each consequence by ∃, i.e. nothing here amounts to nothing existent. Then the perennial idea implies neither that 'we are always wrong' - because something nonexistent may answer to the description and this is perfectly compatible with nothing existent answering - nor that talk about nonentities could not be accounted talk about nothing - because of course it is, talk about nothing existent. The supplementary argument accordingly fails.

§2. *The attack on nonexistent objects, and alleged puzzles about what such objects could be.* What often strikes one (though the impression is something of an illusion) as the most basic objection to the theory of items attacks the notion of a nonexistent item or object. 'Nonexistent objects are not objects' (Linsky 77).[2] But Linsky's main ground of objection, a variation of Quine's 'No entities without identity', has already been met and identity criteria for objects supplied. More threatening is Linsky's charge:

> The whole idea of an item which does not exist is unintelligible; to say that something does not exist is to say that there is no such item, to point to

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[1] Versions of this thesis are rather easily proved in Meinongian logic, and so in simple adaptions of Hinton's "Russellian logic" (the versions depending on how expressions like 'answers to' and 'meaningful' are spelt out). One argument is as follows: If $(\iota x)xf$ is significant then some properties, e.g. analytic ones, are true of it. Moreover every property it has it has, so $(\iota x)xf = (\iota x)xf$, whence, particularising, $(Py)(y = (\iota x)xf)$, i.e. something answers to the description. Conversely, if $(Py)(y = (\iota x)xf)$ then, by quantification logic with identity, $(\iota x)xf = (\iota x)xf$ (for let y, be such a y; then $y = (\iota x)xf$ & $(\iota x)xf = y$), so $(\iota x)xf$ has a property, and so is significant. If Hinton were as philosophically neutral as he pretends in trying to have the Meinongian committed to existential claims, he would be much less ready 'to take for granted' the wrongness of the perennial philosophical idea.

[2] One might almost as well say 'Microphysical objects are not objects'. There are not dissimilar puzzles about the identity and difference of some of these.

> the absence of an item, not to say that some item has the property of not existing. The absence of an item cannot be regarded as yielding any further item, any more than a hole can be regarded as a sort of object. And how can the absence of an item have properties - there is nothing to have them. What has the property?

The objection makes the usual assumptions of the Reference Theory, that an item is a pure reference having only referential properties, and that all quantifiers (no, nothing, what) are referential; and if these were true the objection would be correct. But an item is not a pure reference: objecthood is not characterised (only) referentially. To say that something does not exist is to say that there is no reference, and to point to the absence of a reference, but this does not guarantee that there is no item, and would do so only if an item were a reference and all properties were referential. Since an item can be viewed as the sum of all its properties, referential and nonreferential, the absence of reference and referential properties still leaves something to have the properties, and many properties to have, namely those held nonreferentially. Because of this a nonentity is not a mere nothing.

An object, even though it does not exist, is a thing, with features, which distinguish it from other things, and also relate it to other things; commonly it is a thing or unit which can be thought of or apprehended. A nonexistent object may thus be an object both in the sense of the medieval Latin objectum, meaning 'thing presented to the mind', from which the modern term derived, and in the modern sense of 'thing thought of or apprehended as correlative to the thinking mind or subject' (OED). Similarly nonexistent particulars really are particulars and nonexistent individuals are individuals.

Such details hardly provide a "deep" account of object; but then a deep account is not needed to meet the objection. A fuller picture of objects does of course emerge from the discussion of the properties and sorts of properties objects have and can have and in the classifications of the varieties of objects. But even this does not offer a deep account, it does not furnish the quiddity or whatness of objects, or give the essence of objecthood.[1] Nor should a deep account really be expected. For deep

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[1] A certain Aristotelian turn is easily introduced into the theory, but the connections do not go deep or cast much light. Firstly, every object has some properties, at least logical ones. It is true that whatever conditions, including logical ones, are imposed on objects in general one can think of objects that purport to break them, e.g. objects described as breaking basic logical principles. But such objects do not, despite their specifications, break all conditions. (It would be bleak for a logical theory of objects if they did.) Further, each object will have its own properties, as distinct from those that hold of its kind and for all objects. Therefore, for every object x, x is thus and so, 'thus and so' indicating its properties. But thusness is the property of being thus and so (i.e. λx (x is thus and so)). Hence every object has the character of thusness. Thusness is, in a sense, the essence of objecthood; thusness gives the whatness.

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accounts (e.g. in terms of material substance, individual essence, primary existence) invariably turn out to be reductionistic in orientation and to unduly narrow the class of objects, and commonly turn out to incorporate the Reference Theory. An example will bring out the general point. One deep metaphysical account of object, which runs way back, has it that an object is a material substance, a corpuscular body, usually with certain primary properties. Since everything is an object, materialism is the consequence: all there is, or that exists (since 'material' quickly conflates many distinctions) is, ultimately, material, stuff, and 'whatever is not stuff is nonsense'.[1] As the modern philosopher Hobbes put it, back in the seventeenth century (1909, XLVI, IV):

> ... the universe, that is the whole mass of all things that are ... is corporeal, that is to say body, and hath ... dimensions [and parts which are corporeal] ... . And because the universe is all, that which is no part of it is nothing; and consequently nowhere.

All objects which do not succumb to materialist reduction - there are many, beginning, perhaps more conspicuously, with the abstract objects of mathematics and the impossible objects of logic - are left out on this narrow account (see further p.767). Objects are the most general items of designation; they include whatever something can be said about.[2] An object is thus whatever can be quantified over; it is something, and it always makes sense to ask what it is, and to answer that it is that. It is such features, together with the assumption that all designation and quantification (including that of quantifiers like 'for what x', 'for that x') is existential, that have characteristically led to the objections to theories of objects that they are platonistic and involve damaging subsistence theories.

§3. *The accusation of platonism; being, types of existence, and the condition on existence.* A widespread objection to theories of objects such as Meinong's is that they involve unrestrained platonism. Very often

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[1] (Footnote continued from previous page).

The emphasis on properties and character of objects does not imply that objects are, in some fashion, bundles or complexes of properties (without the glue of substance). All that is true, as later explanations try to make plain, is that objects may be represented as sets of properties (and since a set is a thing, a property adhesive is not really missing).

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[1] Flew's phrase; 71, p.45.

[2] Contrary to Findlay (63, p.342), it is no 'conclusive proof' that it is 'unsatisfactory to hold that golden mountains or round squares are objects', that there are difficulties in Meinong's theory which he met by his doctrine of the modal moment. It would have to be shown, what Findlay does nothing towards, that the difficulties are inherent in a theory of objects and are damaging.

The rest of Findlay's case (63, p.340 ff.) against accounting Meinong's objects objects will bear no more weight. Objects are not all mere objects of thought and cannot all be assimilated to such objects or to ideas; objects can be the independent subjects of assertings; objects do not have being (Findlay's attempt to attribute being and extraontological status to Meinong's objects, p.343, is in fact inconsistent with his earlier account of the theory of objects). Meinong did not misunderstand the grammar of such terms as 'objects'.

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this objection is based on a misunderstanding or misrepresentation of Meinong's theory, and on taking the theory as claiming that objects are entities, that they all exist in some way, somewhere, etc. For example, it is said that Meinong 'countenances impossible things' (Carnap 56, p.65) and that on his theory unreal objects such as the golden mountain and the round square 'have some kind of logical being' (Russell, 18, p.169) and in fact 'the Universe is populated by a variety of entities with most surprising properties' (Passmore, 57, p.186). Furthermore there are many oft-reported witticisms, which are the source of much undergraduate amusement, about overlush landscapes, bloated universes, ontological slums, fantastic hierarchies of non-actual entities, population explosions, and so forth. Of course a theory of objects can easily be made to appear ridiculous if it is misrepresented in these referential terms, so that objects are presented as "queer entities", which if not found in the actual Universe are at least furniture of some similar counterpart of the actual world, and if not here are around or out there. Insofar as these sorts of objections are simply based on a misunderstanding of Meinong's position, or what a theory of objects is about, they can be met by pointing out that Meinong did not assume, and often and explicitly denied that, his nonexistent objects exist or have anything approximating to existence: they are neither entities nor queer entities; and have no kind of being or reality. Because very many objects are beyond the actual they are not part of the Universe at all or found anywhere in the world (cf. Meinong's remarks in TO). The richness and diversity of objects far outruns that of entities of the Universe, and reflects rather the richness of the universe of discourse, of what we talk and reason and think about: once this is grasped there is nothing excessive or ludicrous about the richness and variety of objects.

Normally however this sort of misrepresentation is not based merely on misunderstanding, and cannot be cleared up just by restating the theory of objects: the insistence on describing positions like Meinong's in these referential terms can only be explained as a further manifestation of the Reference Theory, the assumption that intelligible discourse must operate referentially. The assumption, now evident in causal theories of reference, is already conspicuous in Russell's criticism of Meinong (18, p.169):

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[2] (Continuation from previous page)

Findlay even accuses Meinong of falling

> victim to the same prejudice [as] Moore and Russell, the same determination to "analyse" intensional situations into a relation among existents (p.345, rearranged);

and to this he attributes the many absurdities of the theory of objects'. But to find 'a vicious existential inspiration' in Meinong's theory is completely misguided. The theory of objects need not involve, and Meinong's theory does not involve, any such attempt to analyse intensionality away. The main reason why Findlay arrives at this astounding accusation is that he imports a referential account of relations, which he attributes to Meinong, and combines it with Meinong's perfectly legitimate treatment of intensionality as a relation (though not a 'relation' in Findlay's narrow sense). According to Findlay (p.343) 'relations obtain only when all their terms exist, and for such obtaining it does not matter under what description their terms are conceived.' Findlay's relations are, that is, entirely referential relations, a small subclass of relations in the customary logical sense. Intensional relations are not, in general, Findlay relations, but they are quite legitimate, and use of them has none of the evil consequences Findlay alleges.

> It is argued, e.g. by Meinong, that we can speak about "the golden mountain", "the round square" and so on; we can make true propositions of which these are the subjects; hence they must have some kind of logical being, since otherwise the propositions in which they occur would be meaningless.

The assumption has of course persisted, and is woven into the bottom of recent causal and historical explanation theories of reference; for example, it is for this reason that Donnellan is led (74, p.12) to reject what he calls (at first) 'the natural view of many uses of ordinary singular terms':

> If I say, "Socrates is snub-nosed", the proposition I express is represented as containing Socrates. If I say instead "Jacob Horn does not exist", the "natural" view seems to lead to the unwanted conclusion that even if what I say is true, Jacob Horn, though non-existent, must have some reality. Else what proposition am I expressing?[1] The "natural" view thus seems to land us with the Meinongian population explosion.

But the assumption is, as we have seen (in Chapter 1), mistaken: neither the significance, nor the truth, of assertions of the form af require that a exists (in some way) or has some reality.

As should be well known, Russell confused - in a way that persists,[2] and that has in fact done much damage to the credibility of theories like Meinong's - Meinong's theory, according to which many objects have no being of any kind, with his own early theory, outlined in the Principles of Mathematics 37, according to which being belongs to all objects.

> Being belongs to whatever can be counted. If A be any term that can be counted as one, it is plain that A is something, and therefore A is (37, p.449).

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[1] The answer is disarmingly simple: the proposition that Jacob Horn has the property of not existing. Jacob Horn does not require some reality to have properties.

Donnellan appears to think (see also, pp.26-7) that it is a merit of a theory that it maintains an appropriate distance from Meinong's theory of objects (Meinong lives, so to speak, on the wrong side of the tracks), and that if a connection of a theory with Meinongian objects can be turned up, then the theory stands condemned, and that is the end of it (cf.§14).

[2] Thus,

> Some philosophers of a later date, in particular Alexius Meinong and Bertrand Russell at one period of his life, have said that terms like 'chimaera' and 'golden mountain' stand for objects which possess being of a kind, though not existence (Kneale^2 62, p.262).

William of Shyreswood, whose theory of supposition appeared to allow for terms about what at no time exists and so may have included rudiments of a theory of objects, then gets a warning from the Kneales: 'he might find himself committed to some such extravagance'!

But the argument relies on a version of the Ontological Assumption, namely, A is something therefore A is - as if the 'something' could be simply detached. If 'A is' means, as it ordinarily does where 'is' is intransitive, 'A exists', then the assumption is open to all the earlier objections to the OA.[1] If 'A is' means something less than 'A exists', the question is what is meant? For Russell's argument to succeed in assigning being to all (countable) objects, it has to mean more that 'A is an object'; for this does not guarantee being (without illegitimate detachment of 'an object'). At least it does not guarantee being in a sense with any stuffing, for the being guaranteed is simply being an object. For Russell's purpose 'A is' has to ensure 'A has being' - whatever this means - so the assumption implies that if A is something A has being, a watered-down version of the Ontological Assumption, and objectionable on this score. The assumption is, moreover, inconsistent with Meinong's thesis (M1), that some objects have no (kind of) being whatsoever. Let A be such an object: then it is true that A is something, namely some object, and also true that it does not have being, countering Russell's assumption. Russell argues however as follows:

> "A is not" must always be either false or meaningless. For if A were nothing, it could not be said not to be; "A is not" implies that there is a term A whose being is denied, and hence that A is. Thus unless "A is not" is an empty sound, it must be false - whatever A may be, it certainly is.

But the argument is a petitio, and twice assumes the watered-down version of the Ontological Assumption, that if A has features, such as not having being, A is, A has being. The fact is simply that 'A is not an object', if well-formed and significant, always yields a false statement, a statement about A whether or not A has being; for A, though having no being, is nevertheless not no-thing.

A more theoretical argument, designed to convict Meinong of platonism, proceeds by arguing, on the basis of criteria for what counts as platonism derived from the Reference Theory, that whatever Meinong actually said, whatever words he actually used for 'exist', his position is tantamount to platonism. This argument proceeds by taking a platonist as a person committed to the existence of items which do not or only doubtfully exist, and then characterising commitment to existence in such a way that Meinong can be represented as committed to the existence, or being, of all his objects. The criterion for commitment to existence adopted may be that a person is committed to the existence of item a if he is prepared to talk about a ("countenance" a), "recognise" a, attribute properties to a, quantify over a or employ it as the value of a bound variable, or admit 'a' as the proper subject of a true statement. It is certainly true that Meinong was prepared to do all these things.[2] But it is quite unsatisfactory to argue on this basis that Meinong's position was a platonistic one; for clearly such criteria for commitment to existence depend upon acceptance of the Reference Theory. They not only unacceptably assume the correctness of the Ontological Assumption and other components of the Reference Theory, but involve the further fallacy of assuming that everyone accepts them. For even if the Ontological Assumption were true it would not follow that the position, i.e. philosophical opinion, that nonentities have properties is the same as the position that nonentities exist. For even if p is (materially or strictly) equivalent to q, that someone believes that p, asserts or claims or is committed to the proposition that p, does not imply that he believes, asserts or claims or is committed to the proposition that q. A similar invalid principle is involved in the familiar characterisation of the platonistic position as one of being prepared to talk (in some way, e.g. quantificationally) about nonentities.

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[1] The evidence from elsewhere, e.g. the account of the world of being in Russell 12, p.165, where being is equated with subsistence, is that Russell thought of being as a sort of timeless existence.

[2] Chisholm, in his valuable defences of Meinong, seems prepared to do only some of these things (roughly, those that can be represented in free logic). For example, he carefully avoids quantification over nonexistent objects (see especially 72) and concedes to Husserl the claim that 'it is absurd to suppose that there are nonexistent objects', (68, p.374).

When platonism is adequately characterised, it is clear that Meinong's position in the theory of objects is quite distinct from a platonistic one, both in its motivation and its effects. The motivation for platonism, like that for the other standard positions on universals, is provided by acceptance of the Ontological Assumption, and the problem to which it is directed is the gap which appears between what actually exists and what one can apparently make true statements about.[1] The platonist attempts to bridge this gap by widening his conception of what exists or enlarging his claims about what exists. The nominalist tries to bridge the gap from the opposite direction by fashioning his truth claims to fit what does exist, that is by forbidding any enlargement of the class of objects he takes to exist and dispensing with discourse not reducible to statements about these objects. Conceptualist and idealist positions typically try to bridge the gap by a reanalysis providing new abstract or ideational subjects in place of the disputed subjects; the new subjects are said to exist, though perhaps in a different sense. What all these standard positions have as a common assumption is the Ontological Assumption; and without the Ontological Assumption the standard moves in the Universals game are pointless, as Reid long ago realised (cf. Reid 1895, p.368ff.; and see also the beginning of chapter 1). Meinong's position, like that of Reid, differs markedly from the standard positions, and succeeds in evading many of the difficulties in these positions. For it is able to maintain, like platonism, much of discourse; but, like nominalism, it can maintain a scrupulous account of what exists.[2] Because what exists and what can be the proper subject of a true statement are no longer tied together once the Ontological Assumption is rejected, it is no longer necessary to give the platonist's extravagant account of what exists in order to have or explain true statements in which nonentities appear as proper subjects.

The rejection of the Ontological Assumption does not give Meinong's position a merely terminological advantage or claim to novelty, nor does the position differ merely terminologically - or by an elementary translation - from platonism (as the official positions are inclined, quite mistakenly, to claim). The distinction is not merely terminological because the question of what exists is not, as for instance Quine's criterion for ontological commitment might suggest, completely uncontrolled by conditions: one cannot say what one likes about what exists. For to exist is to be in the actual world,[1] and the logical properties of entities are controlled by those of the actual world. Hence these conditions which are sometimes taken to derive from the logical features of the actual world:- first, what exists is consistent; second, what exists is suitably determinate; and third, what exists is unqualifiedly defensible, e.g. if an [the] x which fs exists then an [the] x which fs does f. In short, in the case of an entity we do not require further guarantees about the suitability of its description: the guarantee is provided by its existence.

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[1] A fuller discussion of universals will be found in chapter 8.

[2] Quine claims (in FLP) that any attempt to resolve the universals issue along these lines is facile, presumably because it breaks the referential rules of the game - which reference theorists feel are the rules of the game. But, to paraphrase Wittgenstein 53, the deep reason why the common phenomenon of true statements about nonentities such as universals is felt to be such a problem (and a problem to which the standard theories provide no satisfactory solution) is because of the hold of a mistaken theory of meaning; so that a resolution which challenges such a deeply-entrenched theory does not automatically count as facile.

The platonist then must transfer these conditions to all the objects he claims to exist, a restraint in the treatment of such items which does not apply in the case of the theory of objects. Since Meinong abandons these necessary conditions on what exists in the case of nonentities his position is not platonistic in any good sense; for his nonentities cannot be treated as if they existed. This is especially conspicuous in the case of impossibilia, since they are inconsistent; even the most ardent platonists are reluctant to say that the round square exists. For how can what is impossible exist? Similarly the provision of qualifications on the Characterisation Postulate in the case of nonentities shows that such objects are not being treated as existing - because such qualifications are not needed for entities. For existence in the actual world, i.e. possession of a reference, is a sufficient guarantee that a bottom order object is consistent and defensible, that a description which applies correctly to it cannot lead to logical trouble (because the actual world is, logically at least, it is supposed, trouble-free at base).[2]

If the platonist abandons these conditions which control existence, then, even if he continues to use the word 'exist', his position is platonistic in a terminological sense only. If, on the other hand, he retains these conditions on his notion of object then, even if he abandons the word 'exist', his position is platonistic in that he treats his items as if they existed; he takes over and applies to nonentities an inappropriate logical structure, and one which is dangerous when applied to nonentities because essential safeguards are lacking; for example in the case of the Characterisation Postulate, reference is no longer available to provide a guarantee of assumptibility, yet no other safeguards on the descriptions are provided. The real perniciousness of platonism is that, by his existence assumptions, the platonist is enabled to transfer unchanged to nonentities a logical structure suitable only to entities and evolved in that case. Thus the platonist, instead of constructing a new logic for the new class of objects, merely tries to transfer the old one which is entirely unsuitable.

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[1] Strictly, it is the actual world considered as the totality of entities in their interrelations, the one true world of the empiricist faith. Because the actual world appealed to is this world there is some (unsurprising) circularity in obtaining the (independently uncoverable) conditions for existence in this way. But for the "derivation" other features of the actual world, drawn from other characterisations, are required.

[2] The point does not extend to higher order objects which may, in a paraconsistent setting, be paradoxical.

The transfer is unwarranted since not even consistency is usually established, or even can be established; and it is pernicious, since it may lead to trouble through any of the three necessary conditions for existence. Firstly, the transfer of the determinacy requirement entitles one to expect answers to a great many questions to which there are no determinate answers; hence too the mysteriousness of platonic entities (cf. again Reid). Secondly, the transfer of consistency requirements entitles one to expect consistency where none has been established, and mostly where it cannot be established because of inconsistency or because of classical limitative theorems such as Gödel's result. Thirdly, the transfer of assumptibility entitles one to expect that controls of various sorts on admissible descriptions are not needed; and so it leads both to ontological arguments and to unqualified existence axioms like the abstraction axiom in naive set theory.[1] It is not fanciful to see in this transfer to nonentities of the inappropriate logical structure developed for entities, with its absence of adequate conditions on descriptions and guarantees of trouble-freedom, the source of many grave problems which beset modern logic and the foundations of mathematics, particularly the logical paradoxes.

The necessary conditions on existence are neglected in the ever-popular kinds-of-existence doctrines, under which nonexistent objects are alleged to have existence of some other kind. Thus objects drawn from fiction exist in fiction, mental objects exist in the mind, theoretical objects exist as part of their theory, etc. The doctrine admits of ready send-up, for kinds are easily multiplied up; e.g. paradise and holes have geographical existence, God may not exist but he has religious existence, the superego and all sorts of factors and effects exist in psychology, absolute values exist in objective morals, canned peaches exist as grocery supplies, and perfect spuds and indigo-flowered plumwoods have agricultural, or is it horticultural, existence. It is here too that the subterfuge of saying that mathematical and theoretical items have mathematical existence is likely to be introduced, in order to escape the argument (of §4) that very many objects of mathematics and theoretical sciences have properties though they in no way exist (i.e. they do not exist). Thus, it is said, aether and phlogiston do not exist, but since they could no doubt take their places in consistent mathematical theories they have mathematical existence (cf. Hilbert). But if they don't exist what recommends the terminology 'mathematical existence'? Nothing much: the terminology is otiose. The relevant distinction can be more adequately and less misleadingly marked using familiar terms such as 'consistent' and 'items of a consistent theory' - and, more generally, 'has a place in the subject matter of such and such a discipline or theory'. The much favoured mathematical existence terminology is, like subsistence terminology, misleading, because items such as phlogiston and point masses do not exist (unless again implausible platonism is admitted).

In fact the terminology is unnecessary in a stronger sense. For what motivates the introduction of talk of 'k-ly existence' and 'existence in k'? The idea is that whatever is talked about must somehow exist. It is the Ontological Assumption once again that motivates the kinds-of-existence doctrine; and with its rejection the need for the doctrine - as a way of guaranteeing existence of a sort while trying to sneak around the problems of platonism - disappears.

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[1] Bernays argues in 64, p.277, that unrestricted platonism just does lead to an unrestricted domain and thence to naive abstraction axioms, and accordingly is refuted by logical paradoxes.

Nor is it just that the doctrine is misleading and unnecessary: it engenders its own (gratuitous) problems. Firstly, it leads to violations of the necessary conditions on existence. Consider, for example, the consistency qualification commonly imposed on mathematical existence. The qualification is wrong, because impossible objects can be, and sometimes are, the objects of mathematical investigation and theorising (in theories that are, or may be, inconsistent). But how can impossible objects have, as they should have, mathematical existence? The tenuous linkage of mathematical existence with existence is also challenged in the second problem, that 'exists mathematically' unlike 'exists', is not transparent, and so does not really express an existence notion at all. Consider the true factual identity, 12 = the number of Apostles. Though 12 exists mathematically, the number of Apostles does not. But how can something exist in a given way if things identical to it do not? Thirdly, there is a much larger problem, the problem of the interrelation of objects with different sorts of existence.[1] How can object a which has l-existence (extensionally) relate to object b which exists k-ly, without l-existence transferring to b and existence k-ly to a, i.e. without the kinds collapsing? And, in any case, how do objects of the different kinds relate and interact?

§4. *Subsistence objections*. Many of the same points that go to show that a theory of items is not platonistic also serve to show that the theory need not be, in any damaging sense, a subsistence theory. Yet Meinong is said to have had a subsistence theory - and this has been taken to be very damaging - almost as often as he has been accused of platonism. As regards Meinong's mature theory, the charges are unjustified; even so they have been written into the received history of modern thought. It is true that Meinong's very early theory, with its attribution of Quasisein to every object, was a subsistence theory in much the same way as Russell's early theory. But Meinong subsequently rejected the notion of Quasisein, and it was his settled belief that many objects have no (sort of) being or subsistence (cf. Findlay 63, p.47). To the extent, then, that the subsistence objection to Meinong depends upon the claim that Meinong used, as he is popularly supposed to have, the term 'subsist' ('bestehen') to cover all those objects which did not exist, it is textually mistaken. For Meinong only said of certain objects that they subsist; the term was only applied to bottom order objects that at some time existed, and in the case of higher-order objects the subsistence distinction was used to mark out only certain classes of objects; for example, objectives were said to subsist when and only when the corresponding proposition was true, so "false" objectives did not subsist and subsistence could in the case of objectives be said to amount merely to being the case. In fact, by such shifts, the subsistence commitments of Meinong's theory - which is a selective subsistence theory - could (as suggested earlier, p.4) be largely eliminated. The result would presumably be a theory, like that of the present work, in which the notion of subsistence did not figure essentially. How, with such theories, does the subsistence objection gain any momentum?

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[1] The problem can be restated as a many-worlds problem; for each kind of existence there is a domain of objects of that kind, or a 'world' in Wittgenstein's sense of a totality of things. The problem, which is further considered in chapter 12, is examined in some interesting (if perplexing) detail in Passmore 70, chapter 3, 'The Two-Worlds Argument'.

4.4 THE AUTOMATIC SUBSISTENCE OBJECTION

The subsistence objection is the charge that the items of a theory of objects must all be taken to subsist, to exist in some inferior second-class way, if not to exist. To assess the objection it is essential, first of all, to get some agreement over what is meant by 'subsist', otherwise it is quite unclear that it is wicked to have a subsistence theory. Subsistence normally means an inferior, second class or lowly mode of existence ('subsistence farming', 'subsistence level'), and this surely is what is philosophically objectionable about supposing items which do not exist to subsist. They are supposed to be nebulous items in some second limbo. What is really wrong with having a subsistence theory is that it attempts to solve the difficulties engendered by the Reference Theory and the Ontological Assumption by a retreat to a second-class or lower-grade Reference Theory with a lower-grade Ontological Assumption. But what has to be explained and accounted for is nonreferential occurrence, not having a reference at all, not the possession of some lower-grade reference. A subsistence theory would (try to) treat its subsisting items just like existing ones, but as of lower grade. In this sense of 'subsistence' a subsistence theory is indeed a bad thing, but in this sense the Automatic Subsistence Objection, the view that any theory which treats items which do not exist is thereby automatically committed to their subsistence, fails. For of course one can treat them without treating them as second-class existents, without treating lack of reference as second-class, lower-grade reference. To attribute a property to a non-existent item is not thereby to assume it to subsist if it is the appropriate sort of property for a non-existent item to have - we can for example say that we are thinking about a round square, the number 7, Queen Hatshepsut, or simply something which does not exist, without in any way supposing these items to exist in a lowly way, or to subsist. To suppose otherwise is to make the Lower Grade Ontological Assumption, that whatever has a property must subsist. The motivation for this, as for the whole Automatic Subsistence Objection, is the supposed need to supply a reference - if not a first-grade obvious reference, then a second-grade one. The items must be taken to subsist, it is thought, because it is impossible to conceive of the business operating any other way than referentially - so if there is not obvious, explicit, immediate first-grade reference there must be non-obvious, or mysterious, remote, disguised or second-grade reference - subsistence. In this form the subsistence assumption is motivated by and draws its strength from the Reference Theory. There is no mystery, for example, unless we try to account for nonentities in referential terms.

There are two ways the automatic objection may be developed. On the one hand, 'subsistence' may be used in the sense of lower-grade existence (and a criterion specified, perhaps, or some contrasts provided, so it is clear what fails to have lower grade existence); but in this case the items of the theory do not automatically subsist, and some of them may not. It is similar when subsistence is taken, as by some philosophers, as involving a dishonest existence assumption; though subsistence is then objectionable, the theory of items is not guilty of it, certainly not automatically. If, on the other hand, 'subsistence' is taken to mean merely the attributing of properties to some items which do not exist, or the treatment in the theory of such items, it is quite unclear that one is involved in treating such items as if they existed or as having second-class existence. Hence, although on this low redefinition of 'subsists', a theory of items would be a subsistence theory, what is now wrong with being a subsistence theory other than its preparedness to violate the Ontological Assumption? The answer is Nothing: not much can be made of the use of the word 'subsist' or 'being' (even if it did occur in the present theory) to cover those objects which do not exist, unless it can be independently argued that there is something unsuitable about the treatment accorded "subsisting objects". But there are things wrong with the adoption of such a low redefinition of 'subsists' which breaks most of the usual conditions on, and connections of, subsistence. Most important, even a second-grade or low-level variety of existence, such as subsistence, has to meet the general conditions set out on existence in order to count as a variety of existence. But this the redefined notion fails to do, e.g. "subsistents" such as impossibilia are not consistent, so the redefinition is inadequate.

Although the Automatic Subsistence Objection fails (ultimately because it is based on the Reference Theory), other more specific subsistence objections purporting to show that various theories involve subsistence are not thereby invalidated. Such subsistence objections will try to show that a supposed nonexistent is treated as if it did exist, or too much like an existent item, particularly by the attribution to it of properties which only an existent item could have. This sort of Damaging Subsistence Objection can have real force. For if some properties are, as it is reasonable to suppose, held in virtue of an item's existence or if they are referential properties, then nonexistent items cannot have them. To attribute such properties to these items, then, would be to treat them incorrectly as if they did exist; and a theory which included such properties might well be labelled a subsistence theory, and criticised on the ground of including such properties. Notice how such a subsistence objection is backed up, in terms of appropriateness of treatment of objects, and inappropriate assimilation of nonentities to entities. Meeting such subsistence objections is a more painstaking task; for what they really call for is further elaboration of the theory of items, especially consideration of what sorts of properties are appropriate to nonexistent items and what inappropriate, and which properties are determinate of which nonentities and which are not. As to the second, a well-attested fact, the theory of items must take account of, is the indeterminacy or incompleteness of nonentities. Once the revolutionary step of allowing nonexistent items to have genuine properties has been taken, an immediate problem is to prevent them having, determinately, too many properties, and the wrong sort of properties. (It is primarily a problem of the conditions on assumptibility, and of the coherence of theories with stronger Characterisation Postulates.) To solve this problem is to meet damaging subsistence objections.

To meet these objections is to expose a theory to other objections. If nonentities do not have too many properties then they certainly have too few, at least for logical and scientific purposes. The apparent dilemma is of course met by a theory in which nonentities have just the right properties, neither too few nor too many, but just those they in fact have. Such a theory may be hard to come by, but it is perhaps not so difficult to approximate to it.

A closely related group of objections attempts, then, to exploit the features by which nonentities differ from entities in order to discredit them, and to show that they are unsuitable for logical or scientific treatment. The mistaken referential assumption behind this is that the logic and behaviour of nonentities must parallel that for entities, and that because nonentities do not satisfy the relevant conditions they are unsuitable for treatment by any logical theory. But that nonexistent objects are their own sort of thing, and that they certainly differ from entities in important respects, does not render them unintelligible, illogical, disorderly, illbehaved, incorrigible ... arbitrary, capricious, and at best a source for jokes. Two characteristic features of nonentities are however regularly employed in arguments designed to establish their defectiveness, firstly that they cannot stand in physical relations to entities, and secondly their incompleteness or indeterminacy.

§5. *The defects of nonentities; the problem of relations, and indeterminacy.* From the first "defect" of nonentities spring the jokes, e.g. 'Watch out for the nonactual automobiles as well as the actual ones when you cross the road!', 'You won't starve: you can eat a possible breakfast!', 'I can't afford an actual swimming pool this year so I'm putting in a nonactual one instead; it's cheaper and less environmentally damaging!' - and puzzle questions, e.g. 'How many angels can stand on the point of a needle?', 'How many possible fat men are standing in that (actual) doorway?'. Both the jokes and the puzzles purport to show that nonentities are not to be taken seriously, and that from a theoretical standpoint nonentities are incorrigible (FLP, p.4). But the fact, emphasized first in modern times by Brentano, that nonentities cannot collide with, stand in, or be eaten by, entities both helps to explain why it is a joke to say 'Watch out for the nonexistent cars at the next intersection!' and why it is silly or sick to worry about collisions with nonactual automobiles, and enables questions like Quine's to be answered (as in Chapter 3). For if merely possible objects cannot be physically related (in an entire way) to entities then, as argued, the number of merely possible fat men standing in an actual doorway is zero. It would however be quite invalid to conclude from the fact that nonentities cannot have properties such as these, namely entire physical relations with entities,[1] that they cannot have any properties, or that all attempted attributions of properties to nonentities must be as strong as these.

The second 'defective' feature, indeterminacy, is highlighted by a range of questions which do not seem to have (non-arbitrary) answers, e.g. 'What colour was Meinong's round square?', 'Who was the mother of Hecuba?', 'How many days before he died did Polonius have a haircut?' (Peirce), 'How long are the sides of the Triangle?'. On the basis of such "awkward" questions it is variously charged that theories like Meinong's admit any number of "insoluble" problems, and that nonentities are capricious, chaotic, incoherent, disorderly, well-nigh senseless, and inappropriate for treatment by any serious theory (see especially Findlay 63, pp.56-8, 340 ff; also Quine FLP). According to this class of objections nonentities are defective objects, quite unsuitable for a place in logic or serious theory. Findlay, for instance, considers it a fatal weakness of Meinong's theory of objects that it admits any number of "insoluble" problems - problems which arise because some items are not determinate in all respects. The incompleteness of nonentities, which is the basis of the "unanswerable" questions and "insoluble" problems, is taken not merely as a difference, but as a deficiency. The objections are based indirectly on the Reference Theory, because they assume that all respectable objects, including of course mathematical objects, must satisfy referential conditions, in particular the completeness and determinacy conditions that entities are supposed to satisfy. It is the failure of nonentities to measure up to these referential requirements which is alleged to make them defective. Thus Findlay assumes that because nonentities break some of the rules for referential behaviour, there are no rules which govern them, thus presupposing a false choice between referential rules and logic, or none.[1] Similarly Quine (WO and FLP) assumes that nonentities must be completely determinate, individuable and countable, to be other than logically disorderly elements, that is in order that logical operations such as quantification are applicable to them. But because nonentities do not satisfy referential requirements it does not follow that they satisfy no logic. For logic is not referentially restricted any more than it is extensionally restricted.[2]

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[1] It is assumed (as in chapter 3) that Quine's questions, like Brentano's points, concern "ordinary" entire relations, which are not totally beyond the range of their referential theories. However through reduced relations nonentites can be "physically related" to entities, though they do not stand in entire physical relations to entities. The point, which is important, is explained in 1.21 and further developed in chapter 7.

The theory of objects can simply admit - without incurring any damage - the indeterminacy of very many statements about nonentities, and that very many questions about nonentities, though by no means all, have no determinate answers: it is part of the data on which the theory is built. The problems are resolved within the theory by explicit allowance for and treatment of indeterminacy, e.g. through the theory of negation. Nonentities are not determinate in every respect, e.g. the present king of France is not determinate as to baldness or wisdom, though the present bald king of France is; they are entirely physically disconnected from entities; they are not always determinately distinct, and consequently aggregates of them are not always determinately countable. But they are not thereby discredited or excluded from logical investigation, any more than transfinite numbers are discredited by not having all the features of finite numbers, e.g. the division properties of finite numbers.

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[1] It would, in any case, be very surprising if no rules or logic governed the behaviour of nonentities; for then we should scarcely be able to converse about them as satisfactorily as we do in natural language. Findlay's objections not only offer a false all-or-none choice, but further involve an elementary confusion between the behaviour and properties of the items a theory treats and the behaviour and properties of the theory itself. A theory of chaos need not be chaotic, a theory of inconsistency inconsistent, a theory of vagueness vague, a theory of approximations approximate, and so on. The theory of items can treat of the indeterminacy of nonentities and the insolubility of questions about them without itself raising insoluble questions or itself being radically indeterminate. And such a theory could be "scientific" in a worthwhile sense, that of attempting to account for admitted facts.

[2] The widely disseminated false contrast between referential (or extensional) logic on the one side and no (formal) logic on the other, has been encouraged both by referential logicians and by anti-logic philosophers (e.g. in their differing styles, the later Wittgenstein 53, Marcuse 64, and Strawson ILT). The result has been considerable harm to logic, especially formal logic, which has been quite erroneously seen either (often by conservatives) as useless for philosophical investigation or, very differently (by self-styled radicals), as reactionary and a tool of capitalism or of the establishment.

Part of the case for this false contrast has been examined and found wanting in Slog, 4.5. This work is intended, among other things, to elaborate the argument in Slog.

What the examples reveal are features of nonentities that a satisfactory theory of them should reflect or bring out, much as the so-called "paradoxes" (of Bolzano) of the infinite assembled features of infinity that were subsequently brought out and explained in a coherent fashion by Cantor's theory. In a somewhat similar way indeterminacy and other features of nonentities might be called "paradoxes" of the nonexistent. "Paradoxes" of the infinite are but a case of these. A satisfactory theory of items should be able turn these "paradoxical" features to advantage.

The fact that some statements about nonentities are indeterminate, while others are not, is then part of the data that any adequate theory in the area would try to take account of, and it is a virtue of Meinong's phenomenological theory that it goes some way towards organising and explaining this data. For what can be said truly or falsely about a nonentity and what is indeterminate of it is not an arbitrary or random matter, Findlay, despite his accusations of randomness and chaos, has no hesitation in picking out certain statements about nonentities as indeterminate and others as definitely true or definitely false. Indeed, as regards indeterminacy phenomena, Meinong's theory has very substantial advantages over its standard rivals such as Russellian theory. For the latter, for example, makes none of the requisite pre-analytic discriminations; it assigns not only indeterminate statements but all statements about nonentities, many of which are true, to the same limbo of chaos and falsehood.

If the assumptions on which the defectiveness and incompleteness objections are based were, per impossibile, satisfied, nonentities would be just like entities, and so would have to exist or subsist. Then of course the objections would be telling, since nonentities do not exist. The objections do tell against any theory which tries to treat nonentities just like, or even very like, entities, and they tell against any logic which does not sufficiently differentiate nonentities from entities. To put the point another way, a theory of nonentities may very easily be overlavish in what it permits one to assert truly or sensibly about nonentities. In favour of the austerity of Russell's theory and classical logic, it can at least be said that they do not allow the wild ascription of all sorts of (or any) properties to nonentities. But in fact the classical theory, embodying as it does the Reference Theory, is quite unequipped to treat nonentities, even after reinterpretation of the logic. For there is, for example, no ready-made way of marking out genuine indeterminacy and thus handling the indeterminacy features of nonentities.[1] Once it is conceded however that nonentities are not so like entities, the objections begin to crumble. Not just that, but providing some account of nonentities and their properties helps explain features of the more detailed charges, the jokes, the puzzles, and so on.

§6. *Nonentities are mere shadows, facades, verbal simulacra; appeal to the formal mode.* Though recognising the indeterminacy of nonentities resolves several problems, it soon leads to new objections. For, it is claimed, the incompleteness of nonentities reveals that they are merely shadows of their descriptions or projections of language, since their properties end just where the properties of their descriptions do. This leads to a dilemma: nonentities must either be treated as complete "proper" things, (in the material mode) in which case all the difficulties about indeterminacy arise; or, if incomplete, they are really disguised descriptions, and should really be treated in the formal mode. Hence too Ryle's accusation that Meinong's objects are 'only the verbalised simulacra of genuine entities' (72) and that Meinong's theory was a result of referentialising semantics (71, p.225 ff.), Findlay's criticism that Meinong's objects are merely incomplete facades (63, p.341), and Carnap's contention (MN, pp.65-8) that all Meinong's material mode distinctions should have been made and would better be made in the formal mode. These all amount to attempts to referentialise, in yet another way - namely, as really statements about symbolism - discourse about nonentities.

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[1] Nor are means provided for saying that the statements about nonentities that Quine, Goodman and others want to say are nonsense are indeed nonsense - a point which leads Quine into difficulties (see Brady-Routley 73).

The material mode, in the usual sense, comprises statements about items, whereas the formal mode comprises statements about descriptions or symbols. The distinction is like that between using versus mentioning a description. But clearly the notion of material mode is open to the same ambiguity as the notion of reference itself, that is as between statements about items or statements referring to items. And since the material mode/formal mode distinction is intended to be exhaustive, the material mode cannot be identified with the referring mode unless one is prepared to adopt the view that all nonquotational use of subject expressions is use to refer, which is just the Reference Theory. Unless one smuggles in the Reference Theory, the full material mode must consist of all statements in which subjects occur nonquotationally, that is which are about items which are not words. Yet all the above objections to Meinong's project identify the material mode with the referring mode.[1] If there is, as we have argued and as Meinong believed, an irreducible nonreferring material mode way of using subject expressions, the choice between referring to an item or referring to its description, which the objections presuppose, is a false dichotomy, and one furthermore that is based squarely on the Reference Theory.[2]

All this batch of objections assumes that truths of the sort Meinong was concerned with could, and should, be handled in the formal mode. Even Carnap, although strictly obliged by his principle of tolerance to tolerate the nonreferring material mode of Meinong's theory, thought that it was preferable and less misleading to carry out such an enterprise in the formal mode. That it is preferable presupposes, what is false, that it is possible. It is impossible first, because not all material mode statements about nonentities have formal mode counterparts. For not all the properties of an object correspond to properties of its descriptions. Neither intensional statements about nonentities nor quantified statements about nonentities always have formal mode counterparts. To believe that a ghost is a disembodied spirit is not to believe anything about any word for ghost in any language, nor is it obvious that there is any other statement in the formal mode which holds whenever such a material mode statement holds. (For telling objections to formal mode analyses of intensional statements, see Church 50; also Pap 58 and IE). Similarly quantified statements in the material mode, such as 'Whatever is a nonentity is indeterminate in some respects', and 'Some nonentities have properties' have no direct formal mode equivalents.[1] Secondly, even where nonreferential statements in the material mode do have formal mode counterparts, these counterparts do not have the same function as, the same sense or properties as, and cannot replace the material statements to which they correspond. Although it is true that a ghost is a disembodied spirit iff it is true that 'ghost' is somehow co-extensive with 'disembodied spirit', these statements do not have the same function and we cannot replace the first statement by the second inside an intensional context. As Pap pointed out (58, p.201), formal mode statements do not preserve the logical properties of their material mode "equivalents", e.g. "roses are things" is inconsistent with "But roses are not things", whereas "'Rose' is a thing-word" is not. The statement that a ghost is a disembodied spirit is necessary, whereas its formal mode analogue is not. Because a major aim of such a theory is to present an analysis of intensional properties, modal and intensional counter examples to replacements cannot simply be dismissed.

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[1] Hence also Ryle's objection, that Meinong was the arch reference-theorist because his theory allowed true material mode statements about nonentities, is misplaced, because it relies on just these assumptions - assumptions which are not only mistaken but which would certainly have been rejected by Meinong.

[2] So also was much of Carnap's (misguided) enterprise (in 37), which aimed at either dismissal of or formal mode reanalysis of much "material mode" discourse.

Because formal mode statements cannot always replace material mode nonreferential statements, Meinong's enterprise is distinct from Carnapian semantics, and the distinctions and theses of the theory of objects cannot, despite Carnap's claim (MN, pp.66-7),[2] 'be taken care of' satisfactorily in the formal mode. Carnap's procedure, at this point, does however dispose of Findlay's reckless assertion that

> Modern "semantics" is nothing if not liberal, and only ignorance of Meinong's detailed views prevents it from giving them hospitality. Meinong's round square could be stitched, with complete seamlessness, into the fabric of Carnap's Meaning and Necessity (63, p.327).

Carnap's semantics, which is far from liberal, being basically referential, would have to be extensively modified to include generally either impossible states-of-affairs or impossible objects.

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[1] The reason for this is that variables in the material mode become constants in the formal mode, on the usual referential theory of quotation which accompanies the account of the formal mode. This point could be avoided by liberalising the formal mode through introduction of quotation functions: but such a move would trangress the Reference Theory, because quotation functions are not transparent, and because values of the functions are not restricted to entities (see Tarski's objections to quotation functions, discussed in Goddard-Routley 66).

[2] Carnap relies upon, what is quite inadequate given the generality of his claim, the transformation of a few specific examples.

Similarly, objects are not just shadows of descriptions or names (pace Quine 59, p.198, p.202), because one cannot project discourse about objects onto discourse about their descriptions or names. Not all the properties of nonentities derive from, or even correspond to, properties of their descriptions; and the identity conditions for objects are quite different from the identity conditions for descriptions. Nonentities are not shadows of descriptions or of any other entities (linguistic or not). For consider the metaphor more closely. Shadows stand in a physical relation to that of which they are shadows; so shadows of entities are entities, and shadowy entities are entities. Nonentities therefore are neither shadows of entities nor shadowy entities. Similarly objects are not half-entities, twilight entities (pace Kripke), or any other sort of underworld entities. The temptation to expect some sort of queer entity corresponding to objects or designated by material mode uses of subjects, to see statements about nonentities as referring to nonactual entities, is simply a hangover from the Reference Theory. The feeling that there is something very mysterious in talking in the material mode about objects which do not exist, that such objects must be taken to exist in some strange way, likewise derives from the grip of the Reference Theory. The demand that we explain away objects, either as descriptions or as references, or as attempted combinations such as things-as-described (a reference with a label on it), is simply the demand that we reduce objects to something more "familiar" - references - when they are irreducible, and simultaneously the demand that we reduce nonreferring uses of subjects to referring uses.

§7. *Tooley's objection that the claim that there are nonexistent objects answering to objects of thought leads to contradictions.* Due recognition of the indeterminacy of nonentities also leads, so it is claimed, to serious objections to Meinongian objects and Meinongian semantics, i.e. semantics which make essential use (including quantification over) nonexistent objects. Objections of this sort-relying on quite similar principles for assigning properties to nonentities and as regards disjunction have been independently advanced by Tooley 78 and Williams 69. Their objections, which are important, will be considered in turn.

> The claim that there are indeterminate objects, in the sense required by a Meinongian semantics, seems to lead to contradictions (Tooley 78, p.5).

The claim does not, in its own, lead to contradiction. For indeterminacy can be defined and consistently handled in Russell's theory of descriptions, and a Meinongian-type theory can be modelled in simply modified versions of the Russellian theory (enlarged by neutral quantifiers).

Tooley's argument to contradiction turns on the following further principles and assumptions (not all of which are really required):

(I) Where a is a consistent nonexistent object, Pa is true iff Pa is entailed by the characterisation of a.

(II) Where a is a consistent nonexistent object, Pa is false iff -Pa is entailed by the characterisation of a.

(III) Where a is a consistent nonexistent object, Pa is indeterminate iff neither Pa nor -Pa is entailed by the characterisation of a.

The defence of principles (I) - (III) offered is that some principles are required, and that these 'seem very natural'. The framework is extended by a connective or, satisfying the condition

(*) (P or Q)a is true iff Pa is true or Qa is true (stipulative truth condition for or).

Although Tooley asserts that 'given principles (I), (II) and (III), the claim that there are nonexistent objects answering to objects of thought, etc., leads to contradictions' the argument takes for granted, as well as (*), which is substantive, these matters:

(0) The following object c is a consistent nonexistent one: the golden mountain which is red or green.[1]

(0') Being red or green is part of the characterisation of c.

(0") Being red is not part of the characterisation of c, and being green is not part of the characterisation of c. (Part of here means included in or entailed by).

The argument to inconsistency is then as follows:

(1) "The golden mountain which is red or green is red or green" is true, by (I), (0) and (0'). Further, by (I), (III), (0) and (0"),

(2) "The golden mountain which is red or green is red" is not true, but indeterminate; and

(3) "The golden mountain which is red or green is green" is not true, but indeterminate.

'But then (2) and (3), together with (*), which simply specifies how 'or' is being used here, entails', what contradicts (1), namely

(4) "The golden mountain which is red or green is red or green" is not true.

Observe that principle (II) is not used, and that principle (III) is not really required; But (0) - (0") are required. What is established this is:

Proposition. (I), (*), (0), (0'), (0") are inconsistent.

Proof. (after Tooley). By (I) and (0),

(I') Pc is true iff Pc is part of the characterisation of c.

Thence using (0), that c is red or green is true, and, using (0"), that c is red is not true and that c is green is not true, so by (*) that c is red or green is not true. Contradiction.

Corollary. (I), (*), (0) and (0') (relevantly) entails ∿(0").

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[1] This assumption is far from obvious; e.g. if the mountain is golden in colour, red or green seems excluded: but the example could easily be changed, e.g. delete 'golden' from the description.

Thus the argument by no means establishes Tooley's unqualified thesis, that 'an approach which treats so-called non-existent objects as genuine objects which have properties leads to contradictions' (p.2). For the argument for the thesis also uses (*), (0)-(0'), and by the corollary these assumptions undermine (0"). Accordingly the thesis is not established by the argument.[1] Only an approach which makes further, and unwarranted, assumptions leads to contradictions. And in this respect there is nothing terribly special about nonentities: an over-determined theory of entities will also result in inconsistency (as various semantical paradoxes reveal). The idea that existence of objects guarantees consistency is something of a myth: it relies on such questionable assumptions as that the actual world (considered as everything that is the case) is consistent.

Not only is (0") false in the context of the other assumptions: also other principles are false, in particular (I) is false. For consider (I'), given (0). By (0), that c is consistent is true, and similarly that c is is nonexistent. But consistency and nonexistence are not part of the characterisation of c; hence (I') is false, and similarly (I). So much for the "naturalness" of (I), which (so far as I know) has never been adopted in a theory of nonexistent objects: it is open to immediate counterexamples.

(I) can, of course, be repaired. But satisfactory repairs destroy Tooley's argument to inconsistency. There are two (connected) directions repairs can take: either the class of predicates admitted in (I) is restricted, or the biconditional of (I) is weakened. Unless the class of predicates is severely restricted, the biconditional of (I) should be weakened to a conditional. The reason is very simply that a nonexistent object may have a wide range of features that are not just part of its characterisation, but are in part consequential upon it, e.g. logical features, intensional features, etc. The argument to contradiction breaks down with the weakening: (2) and (3) no longer follow. To approximate the (faulty) argument more closely a biconditional form is required: it will have the following shape, the exact form depending on the type of nonentities introduced:

(IP) where P is a suitable (characterising, nuclear) predicate and a is a nonexistent (consistent) object, then Pa is true iff Pa is part of the characterisation of a (P is one of the predicates of the set correlated with a: Parsons 75, p.75; etc.).

Then the problems about nonexistence and consistency vanish, because the corresponding predicates are not suitable. But at the same time the argument to inconsistency vanishes: given that everything else is properly teed-up Tooley's argument now shows that 'is red or green' is not a suitable predicate. Specifically:-

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[1] Elementary semantical modellings reveal that the Tooley thesis is false. For example, the model of chapter 5 proves consistent a theory of nonentities, which assigns elementary properties to the nonentities, and which treats nonentities as genuine objects - in the sense that they have unrestricted subject roles and are quantifiable over.

New Corollary. (IP), (*), (0), (0), (0') and (0") entail 'is red or green' is not suitable.

That is not quite the end of the matter. There are problems which can affect almost any theory, about throwing in assumptions like (*) which may not conservatively extend the theory.[1] Even if a new postulate such as (*) is presented as merely giving the sense of some new operator, such as or, it may add new theses to the original theory, and in really bad cases it may result in triviality. An example of the latter was the addition of an unscoped indefinite descriptor to Russell's theory (see 1.22). The point (or part of this difficult point) comes out a little more sharply with negation. Define strict negative predicates, by analogy with Tooley's strict disjunctive predicates as given in (*), thus:

(†) (not P)a is true iff Pa is not true.

Now consider the object which is R and not R, d say. Then, by half of (I) (and a conjunction clause), Rd and (not R)d, whence, by (†), Rd is not true, and contradiction.

The correct conclusion seems to be that in a consistent theory of objects, strict negative predicates are decidedly unsuitable; not characteristic (or nuclear). Nothing of course stops someone from introducing (or trying to introduce) such predicates; but because of their collapsing role (among other things) they cannot function in corrected versions of (I). Furthermore - and this may be harder to take because it calls into question a popular critical method in philosophy - an exponent of a theory may refuse to admit, and be justified in refusing, new predicates or operators; for example, an exponent of relevant logic is justified in refusing admission of connectives which destroy relevance, even if they only conservatively extend the theory (for some indication of reasons why see Belnap and Dunn 78).

§8. Williams' argument that fatal difficulties beset Meinongian pure objects. In place of the (golden) mountain which is red or green, Williams considers (in 69) the Polygon which has either an even or an odd number of sides. In place of (I), Williams applies the following principle, extracted from Kenny to determine truth-values of statements like the above:

(P) 'A pure object of type F possesses just those properties which are possessed necessarily by any F' (69, p.55).

Williams contends that 'fatal difficulties beset the account of Meinongian "pure objects"' (p.55; my rearrangement). But the supporting arguments are simply invalid: the main argument effectively distributes a universal quantifier across a disjunction. Williams considers these propositions (about the ideal or pure object, the Polygon):

(2) The Polygon has either an even or an odd number of sides;
(3) The Polygon has an even number of sides;
(4) The Polygon has an odd number of sides;
(6) The Polygon is not a polygon.

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[1] See further the discussion of the limits of postulation in RLR, chapter 15.

For the purpose of his argument Williams specified 'F' as 'polygon' and 'a pure object of type polygon' as 'The Polygon'; and he applies the principle derived from (P):

(Q) For any property G, it is true that the Polygon (more generally: the Universal the n) has G iff every polygon (every individual n) necessarily has G.[1]

Since it is true that

(2') Necessarily any polygon has either an even or an odd number of sides,

(2) is true; but since

(3') Necessarily any polygon has an even number of sides, and
(4') Necessarily any polygon has an odd number of sides,

are both false, neither of (3) and (4) is true. (In fact, by (P) and Williams' specifications they are false, in view of the sense of 'just'.) Williams draws these conclusions:

> If we can go directly from saying that (3) and (4) are not true to saying that they are false ..., then we have a straight contradiction. Even if we cannot, we have a breakdown in inference; for one would suppose that from (2) it followed that one or other of (3) and (4) must be true ... . Further ... from the fact that neither (3) nor (4) is true, together with (3'), there follows ... (6) (p.56, my rearrangement).

But note of these damaging conclusions follow. Firstly, the conjunction ∿(3) & ∿(4) & (2) is not a contradiction any more than its mate ∿(3') & ∿(4') & (2') is a contradiction. A contradiction would result only given the invalid move from (2) to

(7) Either the Polygon has an even number of sides or the Polygon has an odd number of sides.

The move is invalid because (2) is true, but (7) is false, applying (Q), since

(7') Necessarily either every (any arbitrarily selected) polygon has an even number of sides or every polygon has an odd number of sides,

is false. Indeed given (Q) the move from (2) to (7) is tantamount to the invalid distribution move from (2') to (7'). Thus, too, one would not expect that (7) followed from (2), nor therefore that the truth of one or other of (3) or (4) followed from (2). Likewise given (Q), (6) does not follow from the cited premisses; for

(6') It is not necessary that every polygon is a polygon does not follow from the conjunction (2') & ∿(3') & ∿(4'). Since every polygon is necessarily a polygon, (6') is false; but the premisses from which (6') is supposed to follow are true. To establish non-deducibility formally a quantificational model suffices, a model with a two individual domain {a,b} and with necessity interpreted as an identity functor, where, in obvious notation, pa & pb, ea & ∿oa and ∿eb & ob. Then (2'), ∿(3') and ∿(4') are all validated but (6') is not.

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[1] The switch from 'any' to 'every' is made in order to resolve correctly scoping problems in complex sentences.

What goes wrong with the intuitive argument for (6) can be seen by expanding the argument as follows:- Suppose, on the contrary, that the Polygon is a polygon. It follows from (2') - given some assumptions -

(2") For every object η, if η is a polygon then η has either an even or an odd number of sides,

whence

(7") For every object η, if η is a polygon then either η has an even number of sides or η has an odd number of sides.

Hence, by instantiating 'η' in (7") by 'the Polygon' and detaching, (7) follows, contradicting (3) and (4). Thus the supposition that the Polygon is a polygon is false, and (6) follows. However the argument is flawed at two points. First, the inference from (2") to (7") simply generalizes the fallacious inference from (2) to (7), as instantiations of (2") and (7") with 'the Polygon' reveal. In short the argument for (6), with its distribution move from (2") to (7"), involves the same sort of fallacy as that in getting from (2) to (7). Secondly, within the given framework of assumptions, the step from (2') to (2") is fallacious. Principles (P) and (Q) are supposed to provide elimination schemes for statements about pure objects such as universals in favour of statements about unpeculiar well-behaved objects, individual entities, say. But if so (2') is at best about every individual entity and not about every object, and only supports the the inference to

(2"') For every individual entity x, if x is a polygon then x has either an even or an odd number of sides,

and not to (2"). But the Polygon, being a pure object, is not an individual entity; so the needed instantiation of 'x' in (2") with 'the Polygon' is inadmissible, and the argument for (6) again breaks down.

Attempts to salvage Williams' argument will almost certainly appeal to the principle

(R) For every object η, if η has F or G then either η has F or η has G.

But while this principle holds for such disjunctively complete objects as individual entities, it does not hold for incomplete objects, such as universals. For example, though it is true of the object, the Triangle, that it is either isosceles or scalene, it is not true, as Meinong explained in detail (Mög, p.170ff.), that either the Triangle is isosceles or the Triangle is scalene: as regards the equality of its sides the Triangle is indeterminate.

Williams' arguments fail, then, to establish what he (erroneously) thinks is wrong with the whole [Meinongian] enterprise: that it is utterly misguided to try to represent as singular and categorical and about peculiar objects, propositions which are indeed about what they seemed to be when we started: general and hypothetical, and not about peculiar objects (Williams, p.56). The arguments, since invalid, do nothing to show that enterprises like Meinong's are misguided. Moreover ideal geometrical objects, far from being peculiar, are quite familiar to geometers and many of their properties are now known; their only "deficiency" is that, unlike some commonplace entities, they are incomplete in various respects. And unfortunately for Williams' final claim the assumptions (P) and (Q) from which we started are not generally true: they hold only for a restricted class of properties (cf. the discussion of (I) in 7 above). For instance, the proposition that the Wheel has a long history is not truth-functionally equivalent to the proposition that necessarily any (every) wheel has a long history, that the Fox is four-footed is not equivalent to, what is false, that (necessarily) any fox if four-footed, that the Lion is tawny is not equivalent to the proposition that every lion is tawny, and similarly for such propositions as that the Bull is fierce, that Pythagoras was thinking about the properties of the Triangle, and (pace Ryle 71, pp.49-51) that Punctuality is virtuous, since, even if it is, punctual murders and atrocities are not virtous.

Meinong's theory of incomplete objects is a going enterprise; but the standard opposition theories ought to represent a degenerating research programme. For it has yet to be shown, after all these years, if it can be shown at all, that statements about universals can always be eliminated, preserving relevant properties, in favour of hypothetical statements about "ordinary" objects. All we have been offered by those who would eliminate "systematically misleading" statements about universals (e.g. Ryle 71) are sample eliminations, which however exemplify schemes such as (Q), which break down if applied generally. And it would appear to be a corollary of Ackermann's demonstration of the unsolvability of the elimination problem for second-order predicate logic (see e.g. Church 56, p.304) that a general elimination of polyadic universals in the proposed style is impossible.

§9. *Further objections based on quantification and on features of truth-definitions.* It is a commonplace, but entirely mistaken, objection to theories of objects that since quantification over nonentities is essential to them - otherwise it would be impossible to state many principles holding of nonentities - the theories are committed, if not to the existence of their objects at least to their subsistence. For, so it is claimed, quantification requires at least countability, differentiation and determinacy of items. In order to quantify over objects the objects would have to have these properties, and would accordingly, it is said, exist, or at least subsist.

The assumption that quantification involves determinacy or other referential features is completely false. The logical relations of 'every' and 'some', connectives and variables, captured in the formalism of quantification logic are not restricted in their applications to entities. Quantification logic applies - as well as to items like hills and clouds, species and genera, holes and sounds which are not always nicely distinct and countable - to nonentities which violate all referential demands. Moreover quantification logic can be consistently enlarged, as has been observed, by explicit assumptions about nonexistence and indeterminacy, e.g. by theses to the effects that certain items do not exist, do not subsist, and are indeterminate. That quantification logic is not limited by Reference Theory demands is also revealed, not only by the objectual semantics for Q (given in 1.16), but by newer semantics for quantificational logic, for example by domainless and contractional semantics (on these see, e.g. Slog, chapter 7). The standard referential semantics for quantificational logic can be conveniently divided into two parts, (1) a referential account of the truth of atomic wff, e.g. of '$(a_1, \ldots a_n)f$', in terms of the entities referred to (in the model) by the subjects 'a_1',...'a_n' standing in the relation specified by 'f', and (2) a recursive specification of the truth values of complex wff in terms of the truth values of less complex wff, and in the case of quantified wff in terms also of the references of subject terms. Now there is nothing in this account that prevents the replacement of reference relations by other contraction relations such as aboutness relations. In place of the correspondence picture in terms of which 'The morning star is bright today' is true iff what 'the morning star' refers to, Venus, has the property of brightness today referred to by 'is bright today', the contractional semantics says that 'Pegasus is red', for example, is true iff what 'Pegasus' is about, namely Pegasus, has the property of being red which is the conversion of the predicate 'is red'. Domainless semantics goes further (see especially Routley 71). Noting that except for the recursion clause for quantifiers in (2) an analysis of the truth of atomic wff is unnecessary, it offers no analysis, referential or otherwise, of the truth of atomic wff, but simply assigns truth values en bloc to atomic wff, and it changes the recipe for truth value assignments for quantified wff, essentially to the following: (Px)B(x) holds in T iff B(x) holds in T for some x. The rule for the universal quantifier 'U' is analogous: (Ux)B(x) holds in T iff B(x) holds in T for every x. In domainless semantics all the distinctive features of referential semantics are eliminated: none are necessary.

It is all very well, it will be objected, to escape the problem of a truth definition for quantificational logic by assigning truth values en bloc to atomic wff. But the question of a truth definition arises nonetheless for the theory of items: no logical theory is adequate unless underwritten by a satisfactory truth definition (thus Tarski, Quine, Davidson, and many others). However a satisfactory truth definition does not have to be - and for richer languages will not be - a referential one; otherwise the demand is simply yet another underhand way of trying to enforce the Reference Theory. Moreover, a detailed account has already been offered of how initial wff can be assessed in the case of expressions where subjects do not occur referentially. Finally, the theory of items is far better placed to provide a full truth definition than any referential account; for it, unlike the Reference Theory, can provide a truth definition which accounts for intensionality and inexistence.

The truth problem, the problem of seeing how it is that statements whose subjects occur nonreferentially can be assessed for truth (a problem already answered) is at the bottom of a good many objections to the theory of items. For the idea - a theme of the Reference Theory - that only what exists can really have things true of it, is extremely persistent.

§10. *Findlay's objection that nonentities are lawless, chaotic, unscientific.* Like the Hades of Virgil's description, the realm of the nonexistent is 'a vague, vexed region'. It is indeterminate in many ways, and what is indeterminate is lawless and chaotic. But what is lawless and chaotic is no fit object for a science. Hence, firstly, there can, contrary to Meinong, be no scientific theory of objects, and, secondly, theoretical science can hardly be concerned with the investigation of such objects. But the first premiss involves a some to most fallacy: that nonentities are indeterminate in some respects does not show that they are indeterminate in most or all respects, which is what the accusation of lawlessness and chaos seems to require.

4.10 NOT ALL NONENTITIES ARE LAWLESS, OR CHAOTIC, OR UNIMPORTANT

It is the erroneous assumption that nonentities are lawless and chaotic which also lies behind the objection that there is no role for science in the investigation of nonentities and that nonentities are, at least for this reason, uninteresting and unimportant. Thus, for example, Findlay (63, pp.56-58): 'Aussersein remains as a whole, too chaotic to be studied scientifically',[1] 'We can hardly hope to find in [nonexistent objects] a fruitful field for scientific investigation', 'Such ... objects cannot interest a science which is always striving to discover law and system in its material'. Scientific investigation by no means exhausts intellectual investigation, and even if investigation of nonexistent objects did prove (contrary to the evidence of chapters 10 and 11) of little interest to science it could still be of much literary and philosophical interest - as it is.

The case for the interest and importance of the investigation of objects, for the theory of objects, does not rest on the humanities alone. Much of theoretical science, and all of pure mathematics, is an investigation of the systematic properties of nonentities (specially chosen nonentities to be sure, but nonentities all the same); and these are scientific areas of no mean importance. The prima facie case[2] for this undoubtedly controversial thesis has already been alluded to, in §4. Any judiciously-chosen theoretical physics textbook will supply many examples of nonexistent objects which are the prime objects of study. Particle mechanics, for example, whether classical or relativistic, studies primarily mass particles, which have no dimensions and so do not exist; the theory of media investigates rigid bodies, perfectly elastic bodies and so on which have no actual counterparts; the theory of gases studies ideal gases; fluid dynamics ideal fluids; and so on. True, the behaviour of actual fluids, gases, and solids approximates, to greater or lesser degree, to various of the ideal objects. Nonetheless, it is the ideal objects that are the main objects of theoretical analysis. On the face of it then, Findlay's assumption that science does not investigate nonentities is seriously mistaken.[3]

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[1] Findlay's (very mixed) objections to Meinong's theory of objects are not altogether consistent. For instance Aussersein is presented both as 'incapable of scientific treatment because of its excessive richness' and, a few lines later, as 'a strange sort of desert in which no mental progress is possible'.

[2] The case stands up against criticism, as we shall begin to see in later chapters; see especially chapters 10 and 11.

[3] These remarks also serve to undercut Mach's objections to the rationalists in geometry, that the same arguments which show that geometry is not about actual circles, triangles, etc. but rather ideal ones, would prove, what is absurd, that physics cannot be about real physical objects. The same objection is used by Grossmann (MNG, p.162) against Meinong. The reply (which Meinong did not make) is that theoretical physics is not directly about real physical objects; it is about ideal objects to which real objects may, to some degree, approximate. The rationalists were right about geometry, and a similar thesis is correct as regards theoretical physics.

The fact that much theoretical investigation concerns what does not exist is, furthermore, no merely accidental matter. That theoretical science characteristically studies nonentities (or scientific fictions as they are sometimes misleadingly called), is, as earlier writers like Bentham insisted, a conceptual necessity. Theoretical science could not proceed without talk of such objects as species, classes, properties, attributes, idealisations, and so forth. Part of the reason is that science investigates and tries to locate relations between universals, whereas all that exists is particular. Another main part of the reason is that, far from being chaotic and lawless, certain sorts of nonentities are far more well behaved, less chaotic and more lawabiding than entities, which are never so prettily regular.

§11. *Grossmann's case against Meinong's theory of objects.* Grossmann has suggested that Meinong's theory of objects is not a going enterprise, that 'against the most powerful arguments' even Meinong came 'very close to abandoning the most distinctive thesis of his doctrine of the Aussersein of the pure object' (74, p.81).[1] What will quickly emerge, however, is that these arguments are not powerful at all, but for the most part familiar and tried theses drawn from the Reference Theory, and, further, that they give no occasion to abandon the distinctive theses of the theory of objects.

Grossmann begins his case (in 74, pp.69-73) against Meinong's theory of objects (against what he, Grossmann, calls 'Meinong's doctrine of the Aussersein of the pure object') by supposing that there is a serious dilemma, avoided by Russell's theory of descriptions, one horn of which Meinong 'boldly embraced'. The alleged dilemma is a version of the "problem" of negative existentials:

> Consider the fact that the golden mountain does not exist. Now, either the constituents of this state of affairs have being or they do not. If they do, then the golden mountain has being. But this conclusion flies in the face of common sense. If they do not have being, then the relation of being constituent of a state of affairs must be of a peculiar sort: it must admit of terms which have no being. But this conclusion, too, may appear to be unacceptable (74, p.68, my italics).

Grossmann manufactures the "dilemma" by trying to make out that there is something rather peculiar about relations which relate entities to nonentities. Grossmann finds such relations peculiar because they violate the Ontological Assumption, because they relate nonentities to entities, and so assign properties to nonentities, that is, to put it differently again, admit nonexistent objects as constituents of states of affairs. But there is nothing extraordinary about the relations; to suggest there is equally 'flies in the face of common sense' (as Reid explained: cf. 12.1). Given common-sense there is no dilemma.

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[1] Grossmann's main arguments against Meinong's theory of objects are concentrated, not in his book on Meinong (Grossmann MNG), but in his article 74.

This example - with bogus difficulties generated by an insistence upon the Ontological Assumption, which are then supposed to be solved by Russell's theory of descriptions - illustrates well the main method of Grossmann's critique of Meinong (in 74). At each stage in his critique Grossmann sets up conventional difficulties by using facets of the Ontological Assumption Meinong would (or should) have rejected, and then falls back on Russell's theory as a viable alternative account, which solves the problems with which Meinong is supposed to be grappling. But as we have seen, the Ontological Assumption is mistaken, and Russell's theory is neither viable nor a satisfactory substitute for a theory of objects. An adequate analysis of declarative discourse - which has to take intensional and inexistential statements seriously - cannot fall back on Russell's theory.

Rejecting Russell's theory of descriptions, however, removes the lynch pin in Grossmann's case against Meinong. Consider Grossmann's argument against what he calls Meinong's 'second thesis' - namely nonexistent objects are constituents of certain states of affairs. The argument runs in essence as follows (p.69): Meinong's second thesis 'clashes head-on with Russell's theory' (this is true, since Russell's theory excludes nondenoting descriptions as genuine subjects); 'Russell's general view is the correct one'; therefore Meinong's thesis is not true. Given that Russell's theory fails, detachment is excluded.

The remainder of Grossmann's case against Meinong's second thesis is that 'Meinong's argument against Russell's rejection of the second thesis is not sound'! Yet otherwise Grossmann admits that he 'know[s] of no decisive argument against Meinong's second thesis'. But somehow he manages to conclude that he 'must reject Meinong's second thesis' (p.72).[1] One reason is that he thoroughly mistakes what is required in order to reject the second thesis:

> Only if this state of affairs (Ghosts do not exist) is of the 'subject-predicate form' does Meinong's second thesis stand up (74, p.72).

Firstly, the thesis is a particular claim, and so not refuted by way of one example - especially when very different sorts of cases, such as 'Zeus does not exist' and 'Sherlock Holmes was a detective', are outstanding. Secondly, even where paraphrases which preserve main logical features are available - as with 'ghosts do not exist' which can be rendered, preserving leading modal features, 'It is not the case that there exist things which are ghosts' - the paraphrase does not demolish the second thesis, for which it is enough that the sentence may be properly represented in subject-predicate form (not that it has to be).

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[1] A good criticism of Grossmann's attempt to show that the second thesis is false and best avoided (at least at one 'level of analysis') through a "Russellian theory' is given in Griffin 78, pp.2-5. Compare the prima facie case for the Independence Principle, p.32 ff. above: for it is this case, as regards bottom objects, that Grossmann fails to appreciate.

When it comes to higher order objects, such as states of affairs, Grossmann changes sides and sides with Meinong against Russell: 'Meinong's position turns out to be the correct one in the long run' (p.73). For some states of affairs which do not exist are constituents of certain states of affairs, e.g. p('A philosopher's stone exists') is a constituent of 'Someone wished that p'. Thus, according to Grossmann, the second thesis is correct after all - only the objects involved are higher order ones. In a similar way the third thesis, which Grossmann also rejects, is correct.

It follows, since the second thesis is tantamount to the core of what Grossmann calls the 'third thesis', that 'nonexistent objects have some quite ordinary properties' - the core being obtained by deleting the not unproblematic qualifying phrase 'quite ordinary' - that Grossmann has no decisive objection to the thesis, inconsistent with Russellian theories of descriptions,

(3*) nonexistent objects have some properties.

The equivalence of the second thesis and (3*) follows, for instance, thus:- If, in accordance with the third thesis, the golden mountain is golden, i.e. the golden mountain has the property of being golden, then the golden moutain is a constituent of the state of affairs The golden mountain is golden.[1] More generally, if object a has some property ψ then a is a constituent of the state of affairs that a has ψ. Conversely, if a is a constituent of the state of affairs that a has ψ, e.g. the golden mountain of the fact that the golden mountain does not exist, then a has property ψ (and also the property of being a constituent of the state of affairs that a has ψ, etc.).

Grossmann wants however to use 'property' in a much narrower way, in conformity with the Ontological Assumption; and his main thesis is that nonexistent objects, such as merely imagined objects, have no properties (i.e. the OA), but 'are merely imagined to have properties' (74, pp.74-5; also MNG, p.164). In particular, the golden mountain (the working example in 74) is not golden, but only imagined to be golden or thought or conceived of as golden. Grossmann bypasses Meinong's argument that nonentities must have certain characteristic properties,

> that the object whose existence [is denied] must have certain properties and indeed certain characteristic properties. Otherwise, the judgement that the object does not exist would have neither sense nor justification (UA, p.79; Grossmann's translation) -

an argument that is more satisfactory when generalized to show that unless nonentities did have extensional features the commonplace attribution of intensional features would be without focus (see 6.4). Instead Grossmann plunges almost immediately into psychological issues, what is before our minds when the golden mountain is conceived, its existence denied, etc. - as if it was in these reaches that Meinong's grounds for the Characterisation Postulate are to be located. But the main grounds are to be found elsewhere, as the argument cited shows, and a slip Grossman makes helps reveal:

> It seems to me to be true that it is the golden mountain rather than some other entity, for example, the round square, which is before our minds when we deny the existence of the golden mountain (p.74, my italics).

For if the golden mountain is some other object than the round square (as it certainly is), then they must have different properties; yet according to Grossmann 'nonexistent objects do not have properties'; so in particular, the golden mountain and the round square do not have the properties that make them distinct objects.

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[1] Grossmann's propositional representation of states of affairs is simply followed at this point.

Grossmann's argument that all that can be truly said is that 'the golden mountain, as it is before someone's mind, is golden', that (what says nothing more according to Grossmann, p.74) the golden mountain 'is thought of as being golden (that it is conceived of as being golden, that it is imagined to be golden, etc.)', not that it is golden, rests on a false analogy. The comparison is with 'the earth, as it is before someone's mind, is flat'; but the case is dissimilar since 'the earth is flat' is not an instance of the Characterisation Postulate. Were the analogy repaired by replacing 'the earth' by 'the flat earth', Grossmann's argument would fail; for then more could truly be said, e.g. that the flat earth is flat. Of course it does not follow from the fact that someone thinks or believes something is so, e.g. that the golden mountain is golden or flat on top, that it is. But the question at issue is what more can truly be said. Grossmann's appeal to what follows from his psychologistic premisses is not to the point; for what does not follow may yet be true, e.g. for other reasons. However Grossmann proceeds - he has to proceed if his argument is to carry weight, though he subsequently adduces another, of Meinong's grounds for the third thesis - as if Meinong's ground, and his only ground - for claiming that the golden mountain is golden is that Meinong imagines it as golden. Indeed Grossmann contends that it is clear that his diagnosis is correct, on the basis of the following considerations:

> How does [Meinong] distinguish between the properties which a nonentity has and those that it does not have? Meinong admits that a desk which he makes up in his imagination has only those properties which he himself imagines it to have. ... this is the most revealing admission Meinong could possibly make (MNG, p.164; the points are reiterated in 75, pp.74-5).

For, Grossmann concludes, it is not that the desk has properties 'but rather that it is imagined to have' the properties. But Grossmann's argument is seriously flawed. Firstly (what is not uncommon in MNG), he has not reliably reported what Meinong admitted, but operated with his own erroneous elaboration of what Meinong did say; secondly, he has jumped to a conclusion, which no doubt suits his critical purposes, which the actual evidence from Meinong in no way warrants. In this case Grossmann's construction from Meinong's text, presented in 74, pp.74-5, is easily exposed. According to Meinong,

> I can make up a desk in my imagination which has the most outstanding features and which does not exist anywhere in the world. If I do not include in my thought any cost of its production, then there is no justification for attributing this cost to it, while in a real case nothing would depend on whether or not I had thought of the cost, since it would not be missing in any case (Stell, p.46).

Upon which Grossmann comments (74, p.75):

> The imagined desk, then, is said to have all those properties and only those properties which Meinong includes in his imagining of it (and we may assume, all those further properties which it must have if it has the former).

The comment is not coherent. If the desk has all the properties Meinong imagined it to have and further properties which follow or flow from these, then it does not have only the properties Meinong imagines it to have -

contradicting the 'most revealing admission' Meinong is alleged to have made, and blocking Grossmann's immediate inference

> from this distinction between the properties which the desk is imagined to have and the properties which it is not imagined to have, however, is not that the desk has the former and does not have the latter, but that it is imagined to have the former but is not imagined to have the latter (74, p.75; the same move is made in MNG, p.164).

The basic flaw in this inference is in the shift from "the desk (which is imagined) has such and such properties" to "the desk (which is imagined) is imagined to have such and such properties", a shift Meinong's statement does not legitimate, and which is obviously invalid; for its general form is from A to "It is imagined that A". Consider the desk Meinong imagines, or a mountain I visualize: the mountain is green, forested, tropical and basaltic. That is, I visualize a mountain which is green, forested, tropical and basaltic; I do not visualize a mountain which is imagined to be green, imagined to be forested, etc., as Grossmann would have it. The same goes for Meinong's desk. For example, the desk is such that it does not exist anywhere in the world; it is not that it is merely imagined not to exist anywhere in the world. Grossmann is entirely mistaken then in his claim that

> my objection to Meinong's third thesis is as strong [our objection to Meinong's principle of the independence of so-being from being is just as vehement] as my conviction that there is a distinction between what a thing really is and what it is merely imagined to be (75, p.74; also MNG, p. 164).

While the distinction is sound, the objection is not; so in objective strength (as distinct from subjective vehemence) there is much separating the cases. An important point that emerges is that Grossmann is insinuating - what he only later states outright,[1] and what is rather evidently false - that Meinong has confused "(nonentity)a has property ψ' with '(nonentity)a is imagined to have property ψ'. The theory of objects need not make, nor need it depend upon, such an elementary confusion.

Grossmann makes an alternative attempt to explain why Meinong held that nonentities have properties - as if Meinong's straightforward explanation was not to be credited, and a different explanation which could be explained away must be found. This time Meinong is accused (74, p.75) of confusing, not an imagined thing is golden with a thing is imagined to be golden, but what is no more probable, "The property of being golden is part of the complex nature of being a golden mountain" (which is true) with "the golden mountain is golden" (which Grossman says is false): Meinong

> confused the relationship between a complex property and one of its parts with the exemplification nexus between an individual and one of its properties (p.74-5),

that is, Meinong confused

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[1] '... Meinong eradicates ... the important distinction between what a thing is and what it is thought to be' (MNG, p.166).

inclusion with instantiation. (The accusation is repeated in Dyche 76, who follows Grossmann on this matter[1]). Grossmann's grounds for the claim that Meinong makes such a confusion (which is turned into a confusion of a complex of property instances with a complex property) is however largely speculative (though in MNG with an historical element drawn from Meinong's very early work); and the speculation involves various connections which Meinong would rightly have rejected, e.g. of the identification of the ideal object, Triangle, with a certain complex property, or nature (p.75).

Grossmann tries to use the distinction between inclusion and instantiation to rebut Meinong's argument from truths of geometry for the third thesis. Very simply, the (Ideal) Triangle is three sided, and has many other geometrical properties, but it does not exist. If ideals somehow reduce to complex properties, as Grossmann and Dyche would like to think, then the argument can be defused: apparent instantiation and attribution of properties becomes inclusion (and, most important, the OA is upheld). Grossmann's approach is (rather characteristically) oblique: he does not directly criticise Meinong's, or Descartes', argument that the Triangle 'has properties irrespective of whether it exists in reality' (MNG, p.161), but instead sketches a contrasting position, which he defends against Meinong. But the contrasting position (set out in MNG, p.160; 74, p.75) involves replacing statements about individual triangles and the Triangle by statements about the complex property of being a triangle (i.e. Triangularity) something that cannot always be done, and something Grossmann makes no attempt to show can be satisfactorily done. Thus he does not meet Meinong's argument at all. What we are given instead is an iteration of referential principles, of the Ontological Assumption in particular (MNG, p.160, p.161, p.163), and a comparison of the cases of the Characterisation Principle (which Grossmann does not separate from the Independence Thesis) with inclusion principles, e.g. the "falsehood" that the round square is round gets its plausibility from the truth that the property of being round and square includes the property of being round. Meinong has arrived, it is suggested, at his mistaken Independence Principle by confusing complex properties for which an inclusion analogue of the principle does hold with individuals for which no such Principle holds (MNG, p.161). Meinong's assignment of properties to nonentities is even said to 'indicate that he conceives them in analogy to complex properties' (p.161) - which is to deploy the contrasting theory in a really self-guaranteeing way. This is a travesty of Meinong's complex position which does little justice to it.[2] There are, as Meinong recognised, many nonentities distinct from properties, and the assignment of properties to them does not depend upon conflation of them with, what are mostly quite distinct, properties.

Grossmann gives no argument against the fourth thesis he considers false, that being (existence) is never part of an individual; for he is quickly diverted to consider two fundamental assumptions, which in 'combination ... present Meinong with a cluster of insurmountable difficulties'

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[1] Dyche's thesis that Meinong's nonexistent objects are never particulars but always natures rests upon decidedly tenuous evidence: it is briefly examined and rejected in 12.2.

[2] So also is Grossmann's repeated attempt to foist on Meinong a reduction of nonentities to complexes of properties, e.g. p.167. The very limited satisfactoriness of this representation of objects is considered in chapter 12.

(74, p.78). These assumptions[1] - which are inconsistent with the fourth thesis - are

(F1) An object 'has all the features with which it appears before a mind' (an unqualified CP); and

(F2S) 'One can think of the existing golden mountain ... just as readily as one can think of the golden mountain' (p.78).[2]

Whence by (F2S) and (F1), the existing golden mountain is existent, that is, exists; but it does not exist. Any theory which includes both assumptions (F1) and (F2S) is inconsistent: so Grossmann's variant of Russell's argument goes. To which Meinong replied, correctly, that the existing golden mountain 'exists just as little as' the high golden mountain (Stell, p.17). He would similarly have replied, correctly, in response to Lambert's simple variation on Russell's objection (74, p.308) that the round square which exists does not exist:[3] see Meinong's statement that it is false that the golden mountain which exists exists (Mög, p.178).

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[1] Both (F1) and (F2S) are also ascribed to Meinong in Grossmann's MNG, e.g., p.221. But it should have been evident from a passage that Grossmann quotes from Meinong, that Meinong only accepted the combination of (F1) and (F2S) in the case of genuine or ordinary determinations of so-being:

> In regard to every genuine or, so to speak, ordinary determination of so-being, it is in my power, according to the principle of unlimited freedom of assumption, to pick out - by means of adequate intention - an entity which in fact has the determination of so-being (Mog, p.282).

The passage also illustrates however Meinong's tendency to confuse (F1) with (F2S) and (F2).

[2] (F2S) is a special case of the principle of unlimited freedom of assumption for objects, namely

(F2) One can 'pick out - by means of adequate intention - any object' at all (cf. Meinong, Mög, p.282);

more exactly, for any significant object τxA (described using some descriptor τ) one can think of or conceive τxA and assume it to have arbitrary features represented in A. Principle (F2) and other associated principles are studied, and adopted, in 6.4.

[3] Where the objection concerns '"to exist" in the ordinary sense of "being there" (Dasein)' (Stell, p.17), what Meinong calls 'factual existence' or 'actual existence'. Meinong presents, in Mög, p.181 ff., a detailed discussion of what he describes as the 'even more cumbersome "the A that exists, exists"'.

Such replies show two important things. Firstly, Russell's famous second argument against Meinong, as commonly stated, is invalid. The argument is: 'If the round square is really round, as Meinong claims, then the existing round square must also exist' (MNG, p.158). But on Meinong's truth value assignments (as on models of Parsons and Routley) the antecedent is true, but the consequent false. Secondly, (Fl) is not only false, but not maintained by Meinong.

Grossmann's case against Meinong depends essentially however on (Fl): so what is his evidence that Meinong adhered to (Fl)? In fact Grossmann presents no textual evidence that Meinong did maintain (Fl), but alludes to evidence (Mög, pp.287-8) that Meinong questioned (Fl) and more satisfactorily formulated variants of (Fl), such as that an object has all the features it presents itself as having, is presented as having, thought of as having, and so on. There is, moreover, as Griffin remarks, a sizable body of evidence that Meinong did not hold (Fl) or its variants.[1]

> To consider just two examples: Meinong gives a careful discussion of the possibility of erroneous judgements and perceptual illusion (e.g. in Erfgl. pp.30 ff). If it were the case that objects have all the properties they are thought of as having, erroneous judgements about which properties they have could hardly occur, in which case Meinong's discussion of such judgements would be pointless. Of even greater importance to Meinong's philosophy is his distinction (see GA) between the (mental) content and the (non-mental) object of a presentation. He argues for this distinction by noting properties of objects which are not properties of contents and vice-versa. If (Fl) were true it would seem that every feature of a content would be a feature of the corresponding object, and thus the distinction between content and object (or at the very least Meinong's arguments for it) would be lost (Griffin 78).

There is also other more direct evidence: firstly, that adduced above from Meinong's reply to Russell's objection, secondly from Meinong's doctrine of the modal moment, thirdly from Meinong's deployment of the distinction between nuclear and extranuclear properties (both these matters are taken up at the end of 5.1), and fourthly (but closely connected with the preceding points), from Meinong's sayso:

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[1] This also meets Lambert (76, p.253):

> ... concerning the matter whether or not 'the full assumption postulate' [i.e. an unrestricted CP] is an integral part of Meinong's theory, I disagree with Routley. He cites no textual evidence that it is not, and, on the contrary, Russell thought, and I think, there is abundant evidence to the contrary.

I have cited some of the evidence (some of which was alluded to in the article Lambert is criticizing), and doubt that there is abundant evidence to the contrary. Let Lambert cite his evidence, and his evidence that Russell (not altogether a reliable authority, especially since his commentaries on Meinong ceased before much of Meinong's important work was published) thought there is abundant evidence to the contrary.

> I have formerly appealed to the exceptional position of "existential predication" in relation to the "existing round square" and "the existent golden mountain" (naturally by "existing" is meant "(f)actually existing" ...) ... . It would be appropriate, therefore, to consider whether this analytical judgement [of the form 'the ψA is ψ'], whose apparent natural territory is the *Soseinobjective*, is also permitted meaningful application to the *Seinobjective*. The above examples show, in advance of any theory, that the answer must come out in the negative. There is a quite understandable sense to talk of a golden mountain which exists; however it is false to say, on the strength that, of this object that (in an ordinary manner of speaking) it exists (Mög, p.278; cf. also UAII, pp.70-1).

(Fl) is thus rejected by Meinong. Therewith Grossmann's case appears to fail, and many other cases against Meinong collapse.

Grossmann does however present an important argument that Meinong has to adopt (Fl) in an unqualified form - an argument which, if it worked, would seem to show that *any* theory of pure objects is committed to (Fl). The argument is that (Fl) cannot be restricted to a subclass of properties such as

> "ordinary properties": an [object] does not only have all the *properties* with which it appears before a mind, it has all the *features*, *characteristics*, etc., *of whatever kind* with which it appears before a mind; otherwise it would not be *this particular* [object] that appears before the mind. As they appear before a mind, the golden mountain, the existing golden mountain, and the nonexisting golden mountain are three distinct entities. Meinong is therefore forced to admit that the existing golden mountain is indeed existing, just as it is indeed golden ... . (74, p.78; cf. also MNG, p.160).

Grossmann uses essentially the same argument (in MNG, pp.159-160) to show why Meinong could not really adopt the obvious move (which he did consider) against Russell's second objection to the theory of objects, of simply saying that existence is not a (genuine, ordinary, ...) property, namely that he would not have been able to explain why thinking 'of an existing round square is not the same as to think just of a round square' (p.160).

In neither form is the argument sound. That the golden mountain (the 'gm' for short), the existing golden mountain (the 'egm'), and the nonexisting golden mountain (the 'negm') are *intentionally* distinct, does not show that Meinong is forced to admit the egm is existing. For other features - intensional features naturally - than existing may serve to distinguish the objects adequately. In fact what Grossmann thinks Meinong is forced into would *not* serve to distinguish the gm from the negm, since both are nonexisting. Similarly, the response to Russell that existence is not an ordinary property, and so is not assumptible, is open to Meinong. That thinking of an existing round square differs from thinking of a round square may be explained, not by the existing of one and the nonexisting of the other, but by the intensional differences of the objects. For example, the existing round square presents itself as existing, or as Meinong sometimes puts it, has suppositious existence, whereas the round square does not, hence they are Leibnitz-different. And Leibnitz-difference is enough for thoughts of them to be different: extensional difference is not required to separate objects in highly intensional settings.[1]

It is worth noting that rival classical logic theories are in substantially worse position as regards making the requisite distinctions, including Russellian-style theories which, so Grossmann supposes, avoid Meinong's difficulties. Consider the statements (a) G thinks of a [the] gm, and (b) ₲ thinks of a [the] egm, which may well differ in truth value. To apply Russell's theory of descriptions these have first to be paraphrased, for instance, to take the shift Russellians commonly adopt, to (a') ₲ thinks that a [the] gm exists, and similarly for (b'), and thence, given the only plausible scoping, to (a") ₲ thinks that there exists a [the] gm, and similarly for (b"). But on Russell's perceptions (b") always has the same truth value as (a") for both apply the functor '₲ thinks that' to $(\exists x)(xy \& xm)$. The requisite discrimination is lost. Once again other theories of descriptions, including stronger free description theories, fare considerably worse.

Despite the evident superiority, then, of a theory of Meinong's sort, Grossmann thinks Meinong's position is weak (p.79). The egm presents itself as existing ('appears before the mind as containing the property of existing' in Grossmann's terms), but does not exist. Why not - and this is supposed to bring out the weakness - make a similar distinction in the case of 'ordinary properties' such as golden: the gm presents itself as golden, but is not really golden (as a simple extension of a classical theory might well allow)? The answer to this objection, which is not a simple answer, takes us back over ground already traversed: in particular, why it is that it can, and must, be conceded that nonexisting objects have some properties (1.4, 1.5), and what distinguishes characterising properties from other such existence (1.17). But it also includes ground yet to be traversed in detail; especially why the characterisation of an object can determine some of its features, but not others, such as its ontological status (this issue is taken up again in 6.4 ff.).

Grossmann does not try to press this objection, but passes at once (74, p.79) to a recasting of the second objection in terms of objectives, or more exactly of states of affairs. Consider the object, the egm, the state of affairs that the state of affairs that the gm exists obtains. By (F2) one can suppose this and by (F1) then, since the state of affairs obtains, the gm exists. There can, Grossmann contends, be no escape, as there was in the case of "pure objects", by way of "pure objectives", which do not contain their mode of being in the way that there was with "pure objects"; there is no presented (or watered-down) obtaining, for 'objectives themselves must contain their mode of being', on pain of a vicious regress otherwise (p.79). Grossmann's argument depends once again upon assuming that Meinong adopted (F1). Since he did not, the argument fails. Quite apart from this, a theory of objects is by no means obliged to say that objectives or propositions must contain their mode of being. Whether a contingent proposition such as "the gm exists" is true or not depends - not on higher order propositions - but on how the real world is; and its truth conditions can be given, without vicious regress, by a neutral theory of truth. The objective in question, the existence of the gm, does not contain its own mode of being: it does not, and strictly cannot, determine whether it itself obtains.

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[1] Of course exactly what is said depends on how the theory of objects goes. If a theory excludes assumptibility altogether where the properties are not "ordinary", as does Parsons' 74, the egm and the gm are extensionally distinct anyway since the gm is golden but the egm is not. A problem does not arise at all in the form Grossmann has assumed: for Grossmann has supposed that one maximized on assumptibility as it were, so that the egm is golden and a mountain. There are, needless to say, other problems for the Parsons-style approach, e.g. that like many marketed theories of descriptions there is no difference between the egm and the existing round square. That problem is solved however by use of intensional differences or by, what Parsons does adopt in 78, use of Meinong's "watered-down" predicates.

To avoid the difficulties (F1) and (F2) engender in combination Meinong abandons, so Grossmann contends (74, p.80), 'the wrong assumption', (F2) and not (F1). Not so; for Meinong does not adopt (F1).[1] However, Meinong does - it appears, though the evidence is not unequivocal in view of what Meinong goes on to say - qualify (F2): 'this principle of freedom of assumption now requires in fact, if I see it correctly, a limitation in regard to the modal moment' (Mög, pp.283-284). This certainly seems to be a mistake (though not quite the extravagant mistake Grossmann suggests, since it only affects objects and objectives into whose attempted characterisation the modal moment is built). For nothing appears to prevent one thinking of, and making judgements about, the objects with respect to which one's freedom is supposed to be limited, such as the golden mountain that exists (cf. MNG, p.222). The reason that Meinong thought the limitation on (F2) is required is, it seems, that he did not always clearly separate (F2) and (F1). (Of course if (F1) and (F2) are not separated then (F1) is similarly qualified.)

While it is true that 'many of Meinong's difficulties [in Mog, p.278 ff] disappear if the first fundamental assumption ... is rejected' (Grossmann 74, p.81; the omitted words are 'and, hence, the third thesis'), it is false that rejection of (F1) as false, as not holding for all features, involves Meinong in 'abandoning the most distinctive thesis of his doctrine, the Aussersein of the pure object', the third thesis (p.81). Grossmann is entirely mistaken in thinking that the third thesis entails (F1) (as he evidently does; see also the quotation above with 'and hence, the third thesis' inserted). An object may well have some properties (indeed all ordinary or characterising properties) without having all the properties it is conceived of as having (or with which it appears before the mind). Grossmann has relied here, and in drawing out the lesson of his discussion, upon an invalid inference from 'some' to 'all': it is not obvious that objects need not have any of the features with which they appear before the mind, only obvious that they cannot have all the features they are presented as having.

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[1] The same point undercuts Grossmann's argument (74, bottom half of p.80) against Meinong's suggestion that one can think in a roundabout way of the existence of the golden mountain - where existence carries the modal moment. For the argument uses (F1).

Finally, Grossmann's triumphal conclusion in 74 (p.81) that Meinong himself came (in Mög, pp.287-88) 'very close to abandoning the most distinctive thesis of his doctrine of the Aussersein of the pure object', that 'while it is true that the property of being round is a part of the round square, Meinong explains, it is not true that the round square is round', is but a travesty of what Meinong has to say. But this depends on misconstruing Meinong's complex discussions. Whether Meinong did come to say anything approaching what Grossmann attributes to him - a matter taken up again in chapter 12 - it is evident that Grossmann has adduced no substantial reasons for abandoning a theory of objects.

§12. *Mish'alani's criticism of Meinongian theories*. Mish'alani's criticism of theories of a Meinongian cast, in his 62 paper 'Thought and object', has sometimes been taken to do irreparable damage to any theory of objects. It is not difficult to show that it does not, and that what criticism touches a theory of objects is readily avoided. Mish'alani begins by taking for granted existentially-loaded quantifiers: thus his initial assumption, 'when someone thinks of the golden mountain, it is not true that there is something of which he thinks' (p.185). Wrong: particularisation as in A(the golden mountain) $\supset$ (Px)A(x) - is not restricted; it does not exclude functors such as 'Someone thinks of'; so it is true of some object, when someone thinks of the golden mountain, that he is thinking of it. Subsequently Mish'alani backtracks, and admits the introduction of wide quantifiers which may range over nonexistent objects (p.187); but he does not observe that this may be used to undermine his initial claims. Instead he proceeds (p.188) to present a larger theory, main theses of which are ascribed to Meinong. The first four theses of the theory presented are among the central theses of the theory of items, set out on pp.2-3 above. These theses pass uncriticised:

> Not that I think that the first four are correct; only that I can think of no good reason at the moment for maintaining that they are incorrect (p.189)!

It is the following tenet of the larger theory that Mish'alani considers mistaken:

> there is no difference between ...
>
> (1) S thinks of the G if, and only if, (i) S thinks of something, and (ii) what S thinks of is a G, (iii) ... ,
>
> and
>
> (3) S thinks of the G if and only if, (Px)(S thinks of x, and x is a G, ...) (rearranged from p.189 and p.186).[1]

That is, by transitivity,

(M) S thinks of something and what S thinks of is a G ... if, and only if, (Px)(S thinks of x and x is a G ...);

and it is (M) that equates (1) and (3). Mish'alani wants to assert (1), but to reject (3) on the basis of counterexamples like the following:- M thinks, let us suppose, of the man who murdered FDR (i.e. Rossevelt). By (3), for some x, of whom M thinks, x murdered FDR; hence, by considering the converse of the last relation, FDR was murdered by someone, and so was murdered. But FDR was not murdered. Thus (3) is false (p.190). The argument supposes firstly that a principle of converse holds for the murdering relation, that if xRy (x murders y) then y is R-ed by x (y is murdered by x), and secondly that the relation is a Brentano one, that if yRx and y exists then x must exist. Though these assumptions (primarily the first) have been questioned, e.g. by Chisholm and Parsons, and do fail for reduced and hyphenated predicates, a theory of objects need not dispute them.[1] For (3) is not a tenet of the theory of items given, or of any theory of objects that has a suitably restricted Characterisation Principle.

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[1] It is assumed that the dots in (1) and in (3) are filled out in equivalent ways.

Consider the crucial part of (3) for the counterexample, namely

(3C) If S thinks of the G, then (Px) (x is a G),

a consequence of (3). According to this half of (3), a definitely thought of object has the properties ascribed to it; an object presented in thought has all the properties it presents itself as having; in effect, the G is G, without qualification. Consider, as Meinong and others have, the round square that exists; we can readily think of it, but it is false that

(Px) (x is a round square that exists), i.e. $(\exists x)$(x is a round square).

Thus (3C) is false, and with it (3): neither are tempting, once it is seen what they do; nor have they been consistently held by leading proponents of the theory of objects.

Why does Mish'alani's argument appear to carry any weight at all? Because, it seems, connecting principle (M) is true (for certain readings of 'something' and 'what S thinks')[2], and because Mish'alani insists, and audiences are too ready to grant, (1) is true. And if (1) and (M) are true, so is (3), after all. It can be made to appear furthermore that the trouble arises with (M) and (3) through the admission of nonexistential quantifiers. Without (1) however the whole case collapses; and (in the *straightforward* sense) (1) is false. Furthermore the crucial part of (1) corresponding to (3C), viz.

---

[1] Mish'alani's case for the assumptions is however by no means as decisive as he tries to make out. Regarding the second assumption he claims (p.193)

> any attempt to rescue the view which is criticised in this paper by restricting the type of function which may take non-existents for arguments would be self-defeating.

This is far from true (the aim is not, in any case to provide an analysis along the lines of (1)).

The main argument in favour of the first assumption (p.192) depends upon refusing to distinguish predicate and sentence negation; so it is worth little. However, Mish'alani's criticism of theories which reject the principles of converse is of interest, and is taken up again in chapter 7.

[2] Consider the RHS of (M) and apply ξ elimination of quantifier P. Then

(M') (Px) (S thinks of x & G(x) & ...) iff S thinks of a and G(a) and ...,

where a $\approx \xi x$(S thinks of x & G(x) & ...). But a is not, of course, merely what S thinks of, but what S thinks of which is G, etc.

(1C) If S thinks of *the* G, then what S thinks of is a G.

But what S thinks of is, by the antecedent, *the* G; hence

(1C') If S thinks of *the* G then *the* G is a G.

Since however it is always true that someone can think of *the* G (by a principle of freedom of thought: see chapter 6),

(1D) *the* G is a G, i.e.

an unrestricted CP follows. Hence (1) is false. Although Mish'alani's objection may look, at the outset, as an objection based on the alleged problem of relations between nonentities and entities, on examination it turns out to be an objection relying upon use of an unqualified CP, which is infiltrated by way of an explication of definite descriptions in thought contexts.

The theory of items also yields a straightforward answer to the question that generates the remainder of Mis'alani's discussion, namely

> Is it true that:
>
> (2a) S thinks of a G if, and only if, $(\exists x)$(S thinks of x, and x is a G),
>
> provided that a G exists? (p.194),

a question that is refined thus (p.196):

> what should interest us is whether there is a sense of "to think of" wherein the expression "thinks of" occurs both in the antecedent and in the consequent of (2a) such that (2a) remains true.

The answer is that there is such a sense, a transparent sense (it is *not* Mish'alani's 'subjective sense' which is not transparent). Let 'T' symbolize, such a transparent sense; and represent 'a' in 'a G' as 'an arbitrary', i.e. 'a G' is symbolised $\xi xG(x)$.

Suppose, first, $ST\xi xG(x)$. Then

$$ST\xi xG(x)\ \&\ \xi xG(x) = \xi xG(x)\ \&\ (\xi xG(x))E,$$

since by the provision, a G exists, therefore, $(\exists x)\ (STx\ \&\ x = \xi xG(x))$. In fact the *stronger* form which uses $G(\xi xG(x))$ - this seems to be what Mish'alani is thinking of - also results from $(\xi xG(x))E$; whence $(\exists x)$ $(STx\ \&\ G(x))$. Suppose, conversely, $(\exists x)(STx\ \&\ x = \xi xG(x))$. Then, for some a, $STa\ \&\ a = \xi xG(x)$, whence by transparency of T,$\xi ST\ xG(x)$. The stronger form $(\exists x)(STx\ \&\ G(x))$ links with ST(a G) for a different 'a', namely 'a certain'. Firstly, ST(a certain $xG(x)) \supset (\exists x)(STx\ \&\ G(x))$ as above, using an existence-qualified CP for *a certain*. Conversely, for some b,$STb\ \&\ G(b)$. But if $G(b)$ then b is a certain x which is G, i.e. b = a certain $xG(x)$.

Hence by transparency ST(a certain xG(x)).

§13. *A theory of impossible objects is bound to be inconsistent: and objections based on rival theories of descriptions.* Although hostility to possible objects has abated somewhat[1] in recent times with the rise of modal logic semantics, and the consistent development of theories of nonexistent objects which occur in alternative possible worlds, hostility to impossible objects remains undiminished; and there have been continuing attempts to show that impossible objects and theories of them, are incoherent. Impossible objects have been a particular target of recent attack because it has been felt (rightly enough) that impossible objects should be impossible, and (wrongly) that what is impossible should be inconsistent and so incoherent. Impossible objects, furthermore, offer a place of maximum leverage to attack theories of nonexistent objects: such objects, if any, are likely to be serious trouble makers. Many of those who contend that there is something seriously wrong with any theory of impossible objects would like to think that there is something pretty wrong too with a theory of purely possible objects, and would like to be able to show it - if only they knew how.

Objections to impossible objects are almost invariably derived by taking over principles for possible objects and entities and showing that they lead to trouble - inconsistency or the like - when applied to impossible objects. They depend, that is, upon assuming that the logic of impossible objects is the same as, or very similar to, that of objects which are not impossible. But, as Meinong replied to Russell's objections to impossible objects, the logic is not the same; and moreover only a little reflection indicates that it would not be expected to be the same. Early objections to impossible objects, such as those of Russell, depend upon two assumptions, which though they hold for entities and for consistent situations, are separately questionable when extended to impossible objects and inconsistent situations, namely

(1) Impossible objects are, like entities, fully assumptible, i.e. an unrestricted CP holds.

(2) Classical logic holds with respect to all objects and situations.

However, as we have seen, these assumptions both fail; and with their rejection the way is open for the development of a coherent theory of impossible objects (and in more than one direction - consistent and paraconsistent). With their rejection too Russell's case against impossible objects, and many of the later variants upon Russell's objections are removed.

These objections are not however simply irrelevant in the way Grossmann amazingly supposes (MNG, p.158: similarly Gram 70):

> Perhaps, Russell felt his objection ... that impossible objects violate the law of contradiction ... had more of a thrust because he thought of logic, not as applying to what there is, but as encompassing everything. Impossible entities show that this conception of logic is mistaken!

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[1] With those opposed to modal logic, such as hardline empiricists, hostility has scarcely abated. But the with rise of an alternative theory, the weakness of their position has become much more evident.

Grossmann's very rejection of the idea of a universal logic already applies elementary logical principles concerning impossibilia, that they are within the range of the quantifier 'everything', but that they are not among what is. Moreover Grossmann at once proceeds to reason and argue, in ways that are open to (often unfavourable) logical evaluation, about impossibilia and their properites. While Grossmann could of course fall back on a redefinition of 'logic', in the familiar sense tied to argumentation and deductive reasoning, his thesis that impossibilia, and also possibilia, are beyond what logic encompasses is self-refuting as soon as it is defended logically.

Grossmann seems blissfully unaware how much damage his charmingly naive - and correct - claim

> Contradictory entities ... quite obviously must violate the law of contradiction or they would not be what they are (p.158),

does to orthodox classical reasoning, reasoning he adopts when it suits him and does not question. Let a be such an object; then for some B, B(a) & ~B(a). Hence, by closure under strict (or material) implication, every statement whatsoever is true. Strictly then Grossmann's philosophical position is logically trivial:[1] but with reconstruction the trouble can no doubt be isolated.

The method of endeavouring to impose principles that apply to entities on impossible objects remains the underlying strategy of more recent and sophisticated objections to impossible objects, which rely upon principles concerning descriptions and identity. Two examples of this favoured strategy will be examined in some detail, an argument of Lambert (which is considered in this section and the next, i.e. 12 and 13) and a rather similar objection made by Tooley and Burdick (which is taken up in section 14).

Lambert's argument (of 74 pp.310-2) that 'there are no impossible objects!', is summarised accurately (in his review 73, p.229) thus:

> To the question, under what conditions does the expression 'the so and so' pick out an object? a natural answer, and one contained both in Russell's theory of definite descriptions and in modern free description theory, is this: for any object x (construed in the widest possible sense of the word 'object') the so and so is x if and only if x and x only is so and so. Substitution of an inconsistent predicate for 'so and so' in the condition just described, and with quantification interpreted either referentially or substitutionally, yields the verdict that there can be no such object; for example, it follows that there is no such object as the round square. To be sure the condition on objecthood presented above might be challenged; after all it fails in Frege's theory of definite descriptions. But then we have a right to ask what the conditions of objecthood are in Meinong's theory.

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[1] The fuller argument uses such textually supportable facts as that Grossmann adopts, for an important class of cases, Russell's classical theory of descriptions and its underlying logic, that however he extends quantifiers to range over nonentities - so it is that nonexistent objects, all of them,

(footnote continued on next page)

4.13 LAMBERT'S ARGUMENT AGAINST IMPOSSIBLE OBJECTS

The allegedly 'natural answer' to Lambert's question as to "the conditions of objecthood" - in more aseptic terms "How does one identify the *object* which is so and so?' (74, p.311) - is given then by none other than the principle of minimal free description theory,

IP $(x)(x = (Iy)(y \text{ is so and so}) \equiv.\ x \text{ is so and so and only } x \text{ is so and so})$,

already rejected as mistaken in 1.14[1] and derived in a sharply qualified form in 1.20, the qualifications being referential in character (i.e. to existentially-loaded quantifiers and transparent predicates). In short, Lambert's answer gains its "naturalness" by importing referential assumptions; remove the referential setting - which is entirely inappropriate in the case of nonentities - and its naturalness vanishes. Yet just such removal is what the main argument depends upon: the quantifiers in IP must be interpreted so as to catch, in one way or another, impossible objects. Lambert assumes, that is,

> the formula '(*x*)(...*x*...)' is to be read as 'for every *object* *x* ... *x* ...' and not as just 'for every existing object *x* (or every possible object *x*) ... x ...'. In other words it ranges over the nonsubsistents as well as the subsistents (p.311). Alternatively the quantifier expression '(x)(... x ...)' may be interpreted 'substitutionally', that is, as being true, just in case ... '... *x* ...' is true for all singular terms in place of '*x*' ... *provided* '*t* = t' is true for all singular terms *t*. (p.312).

Thus in either interpretation the singular term 'the round square', or, what is said to be the same (p.311), (Iy) (y is a round square), is an admissible instantiation of the universal quantifier, and in either interpretation such terms are open to particularisation, and the corresponding particular quantifiers are similarly neutral. Hence the way is open to show that there are no impossible objects, however generous the quantifiers are taken to be.

Lambert's argument from (the neutral formulation of) IP which is supposed to 'demolish the objecthood of impossible objects' (p.312) is as follows: From IP by distributing quantifiers

T. $(Px)(x = (Iy)Ay)) \equiv.\ (Px)A!x$.

Now let A(x) represent some inconsistent wff; in Lambert's example 'x is a round square'. Since no object can have inconsistent features, $(Px)A!x$ is false for such A. Hence by T, $\sim(Px)(x = (Iy)A(y))$, there is *no* object of any sort that satisfied A.

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[1] (continuation from previous page)
'have no form of being whatsoever', etc. In chapter 12, another respect in which Grossmann's theory is inconsistent, and so trivial, is observed.

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[1] For the case against IP see also Routley 76, pp.249 and 251.

Unfortunately for Lambert, IP, so neutralised, does too much. Firstly, the same simple modelling[1] which Lambert uses to establish his 'major negative thesis that Russell did not "demolish" Meinong's theory of objects', 'did not prove that there are no non-existent impossible objects', and did not show 'that the world of Aussersein is impossible', also undermines his major positive thesis that:

> it is possible to bolster that fragment of [Russell's] argument dealing with impossible objects so that it can be seen as a very strong inclining reason against at least there being any impossible objects (p.304).

For it follows from IP upon substituting 'a round square' for 'so and so'.

IPC: (Iy)(y is a round square) = (Iy)(y is a round square) .
(Iy)(y is a round square) is a round square.

But on the simple modelling (indeed by Lambert's own arguments verifying (1) - (3)) the antecedent of IPC is true but the consequent is false. Hence the simple modelling provides a countermodel to IP, and so to Lambert's argument as well as Russell's.

Secondly, inconsistency results. Were neutralised IP logically valid, since (Iy)(y is so and so) = (Iy) (y is so and so) always on Meinong's theory (and according to reputable free logic[2]), the unqualified characterisation principle

CP: (Iy) (y is so and so) is so and so

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[1] Lambert sketches in 74 a simple modelling which shows that each of what he takes to be the key theses of Meinong's theory of objects, namely (1) every singular term stands for an object, (2) there are nonexistent objects, and (3) nonexistent objects can have characteristics, can be true while nonetheless (4) the statement form 'The so and so is (a) so and so' is not logically valid. The modelling is an adaption of Carnap's method IIIb of definite descriptions (MN, p.36) which adds to the domain of things the null thing, *, which does not exist and which is to serve as 'the bearer of any definite description whose characteristic matrix is not true of exactly one thing in the domain of discourse, for example, to a definite description such as "the round square"' (p.309). The model is designed to guarantee (1), * makes (2) true, and (3) holds true because the round square, for example, is self-identical, * being identical with *. Thus the model verifies each of (1)-(3).

But nothing in the domain of discourse is both round and square. Not even *, that is, the round square. So, where 'so and so' is 'round square', (4) is true (p.309). Hence too Russell's objections to Meinong's theory which turn on use of a full CP fail.

[2] On the strength of this parenthetical remark Lambert writes (76, p.252): 'Though he should know better, Routley gratuitously and falsely remarks that such a principle is also adopted unanimously by free logicians'. Wrong, he did not: what he did suggest was that free logics that reject (Ix)A = (Ix)A are not reputable.

would be logically valid (contradicting (4)). And CP leads directly to inconsistency. As previously explained, the full CP is inconsistent with the validity of any logical laws, including CP itself. For suppose otherwise that CP is universally valid, i.e. every definite description (Iy)(... y ...) satisfies CP. Consider (in the metalanguage) the z such that z does not satisfy CP. Then it is logically true both that the x which does not satisfy CP satisfies CP and that it does not satisfy CP, which is impossible. Therefore, by reductio, CP is not universally valid. So IP is not valid, and should be rejected.

Lambert's response is: in that case (i.e. when IP is rejected) Meinongians should

> present another distinctive identity criterion à la Quine for objects (objecta) in general, and impossible objects in particular, ... no relevant concrete alternative is presented by Routley (76, p.252).

A Meinongian may well decline to meet this 'challenge': the call for such identity criteria has its extravagant side (as will emerge in the next section), and Quine's dogma 'no entity without identity' is no more grounded in 'common sense' than the referential assumptions that underlie it. Even so the challenge can be, and has been, met.

But first observe that Lambert's question has shifted, and his standards rise when it appears that impossible objects can meet them. Lambert's initial question as regards criteria for objecthood can be phrased: as regards object x, exactly when is x = (Iy)A(y)? More precisely, fill out the following wff in a nontrivial fashion:

$$x = (Iy)A(y) \equiv. \text{---}.$$

That challenge was met in the following nontrivial way (in 76, p.249):

$$x = (Iy)A(y) \equiv. (\text{ext } f)(xf \equiv ((Iy)A(y))f);$$

more generally, objecta are the same iff they coincide in all extensional respects. This is a 'relevant, concrete alternative'; it is quite specific; it answers Lambert's question (though using second order considerations) in the quite precise sense of filling out the schema indicated. In response Lambert, like Quine, upgraded his standards for satisfactory identity criteria - a most characteristic philosophical response.

§14. *Identity again: Lambert's challenge and how Quine hits back.* Lambert has objected (76, p.252) that the basic identity criterion offered for impossible objects, namely coincidence in all extensional respects, does not meet the question he posed for Meinongians, 'Quine's question: What are the nontrivial identity criteria for impossible objects?' (74, p.3.3). For firstly, 'the sense of "identity criterion" at issue is the well-known sense explained by Quine in many places, for example in [WO, chapter 6]' (76, p.252). Secondly,

> just as the criterion [offered] is inadequate to distinguish say, classes from attributes - both kinds of entities satisfy it - so it is inadequate to distinguish Meinongian objects, qua objecta from say, objects qua objectives (76, p.252).

This is simply false. While classes as usually conceived[1] are identical if they coincide in all extensional respects, attributes are not. To take a familiar example the property of being a featherless, comparatively hairless biped differs - for instance for modal reasons - from the property of being human, though in extensional respects - as regards the classes of entities picked out - they coincide. The bottom identity criterion for attributes is of greater than modal strength. Objecta and objectives differ similarly: identity determinates for objectives are intensionally stiffer.

While it is true that the basic identity determinable offered for impossible objects does not differ from that given for entities, that is no objection. For impossible objects are sharply distinguished from entities in other respects than their identity conditions (see §3 above). It is a mistake to try and rest the whole weight of the distinction between different sorts of things on their identity conditions.

Lambert's first point is harder to get to grips with. For nontrivial identity criteria for impossibilia have been given. And these will serve to meet Quine's questions (e.g. WO, p.200) as to what counts as the same (impossible) object and what counts as another, and therewith Lambert's parallel questions (74, p.311), e.g. the round square and the square round are the same, the round square and the elliptical square are different. What more do they want in the way of "identity criteria"? Quine hardly explains this in the source Lambert cites (namely WO). Indeed the expression 'identity criterion' does not seem to figure at all. In the case of attributes, Quine simply tells us that the (rather conventional positivistic) 'objections to propositions on the score of identity applies unchanged to attributes and relations' (p.209). He does not even consider the classical account of identity of relations (the account given for instance in PM).

Fortunately Quine has recently elaborated his position in 75.[2] He puts his case against criteria for identity of objects like those offered for impossibilia in the special case of certain higher order objects, namely attributes; but he makes it plain, in the course of his further campaign against attributes, that his objections apply equally in the case of other objects than physical entities and classes constructed from these.

Quine's lead-in question (75, p.4) is: 'What does the identity of attributes consist in?' The answer is going to be that there is no satisfactory noncircular answer, and hence that the notion of attribute is not really intelligible. For 'the notion of attribute is intelligible only insofar as we already know its principle of individuation' (p.7) - which, according to Quine, we don't. But to show the latter he has, at the very least, to dispose of straightforward answers to his lead-in question.

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[1] Subsequently the usual conception will be questioned. Nonetheless, something of the usual contrast of classes and attributes as, respectively, extensional and intensional objects will be retained.

[2] Lambert kindly drew my attention to this elaboration.

The 'interestingly exasperating answer' Zedsky offers is that usual identity criteria suffice for attributes as for other objects: objects whether attributes or other, are identical (under a given determinate) iff they have the same features (as restricted by the indeterminate). But Quine is not interested in niceties such as identity determinates,[1] so determinates can be dropped for the purpose at hand, and suitable restriction on features understood. It is an old objection to the criterion that, so expressed, it is circular. But Russell, and others, set the definition in formalism and so showed how circularity was avoided: $x = y$ iff $(f)(xf$ iff $yf)$. Quine's initial move against Zedsky is this old-fashioned one: 'Zedsky is evidently caught in a circle, individuating attributes in terms of, in the end, themselves' (p.4). The move is met in the familiar way: by a definition which eliminates sameness in favour of quantification and biconditionality. Quine of course insists upon putting his points in terms of classes - or maybe Zedsky, eager to show how it could all be done in terms of notions Quine finds acceptable, foolishly sets the point in terms of classes. So the criterion gets transformed - not necessarily preserving equivalence - to $x = y$ iff (z) $(x \varepsilon z$ iff $y \varepsilon z)$, which makes 'no mention of identity' (p.5) - nor of what Quine premisses his next assay upon, 'mention of classes of attributes' (p.5). Quine assumes that the formula $(z)\ (A \varepsilon z \equiv. B \varepsilon z)$ for identity of attributes A and B 'contains only the single variable 'z' for classes of attributes'. No doubt this suits Quine's argumentative purposes;[2] but Zedsky, if he sticks to his guns, can simply say that 'z' is a variable for objects.[3] On the face of it, this blocks Quine's "deeper" ground:

> The real reason why the formula does not clarify the individuation of attributes is not that it mentions identity of classes of attributes [it does not], but that it mentions classes of attributes at all (p.5).

Again it does not. Presumably Quine would restate his objection in some such terms as these: quantification over objects involves, in this case, quantification over attributes, and this supposes classes of attributes - whereupon the objection can proceed as before:

> we have an acceptable notion of class, or physical object, or attribute, or any sort of object, only insofar as we have an acceptable principle of individuation for that sort of object. ... (p.5).

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[1] Quine makes the characteristic referential mistake of expecting a single criterion of identity at the outset: 'attributes, I have often complained, have no clear principle of individuation'. (75, p.3).

[2] There are considerable advantages of course in considering doctrines of nonexistent philosophers such as Zedsky and Wyman. For positions that are perhaps hard to refute can be twisted into more malleable form, and then criticised, with the result that it can look, especially to those who have only glimpsed the original position from a limited perspective, that the original position has been equally criticised.

[3] Naturally some nonsignificance, such as 'roundness belongs to 17', will have to be written off as false while the logical theory remains two-valued.

And so on: ... 'no entity without identity' ... . It is important to see what the objection assumes but does *not* state. It assumes that an acceptable principle of identity for objects of a given sort cannot be provided through quantification which includes quantification over objects of that sort, *because such quantification already presupposes identity, or individuation, principles.*[1] That assumption is, it has already been argued, false. One can perfectly well talk of all objects of a given sort without there being sharp or especially clear individuation of objects of that sort: to previously cited examples such as natural objects of various kinds, e.g. clouds, mountains, waves, forests, can be added of course examples of just the kinds of theoretical objects Quine would like to dispense with, propositions, ideals, etc. Quantification does not require sharp individuation of elements, enumerability of elements, etc. (see 1.15, 1.16). Hence identity criteria for objects of a given sort can be satisfactorily supplied - without circularity - through accounts which involve, among other things, quantification over objects of the sort in question.

Even so objects so individuated may seem to compare invidiously with the extensionally hard sorts of objects Quine likes, notably physical objects and classes. For these objects are, so we are told, *well* individuated - physical objects by coextensiveness (which is an 'impeccable principle' for *all* such objects, no matter how vague their boundaries), and classes by coextensiveness (or coincidence) of their members which are ultimately (in grounded cases) physical objects. None of this is as rock hard as has been put about. For what is coextensiveness? It is (as, e.g., OED informs as) *sameness* of extension (in space, space-time, etc.). And so meeting the old fashioned objection of circularity leads once again to quantification over objects or the like; in short, the questions Quine takes to be problems for attributes seem to be reappearing for physical objects. For consider first how sameness of extension is usually characterized in the case of classes (how Quine *does* characterise it): x and y are coextensive iff every member z of x is a member of y and conversely, i.e. $(z)(z \varepsilon x \equiv x \varepsilon y)$.[2] A comparable definition of coextensiveness for physical objects is now readily glimpsed, namely that commonly adopted in the calculus of individuals and mereology, which simply replaces membership by the part relation; that is, where $z < y$ reads 'z is a part of y', $z = y$ iff $(z)(z < x \equiv z < y)$. (For such a definition see Goodman, and Quine himself). But this involves, among other things, quantification over the sorts of objects to be individuated. The escape Quine thinks *he* has from the problems he sets up for intensionalists is illusory.

Such identity criteria, as having just the same parts, are satisfied by all objects that significantly have parts (including classes and other nonentities); in particular, they are satisfied by natural objects such as clouds for which it was said clear individuation was lacking. The upshot is that, contrary to what Quine implies, identity tests such as coextensiveness are not sufficient for what would ordinarily count as clear individuation.

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[1] There is a similar, initially more plausible looking, assumption made with regard to classes.

[2] Quine assumes existential loading of the quantifiers: but it is written not into the symbolism but the intended interpretation.

Clouds are presumably identical iff they are coextensive, but they are hardly well individuated. The coextensiveness test does not enable objects that satisfy it to be counted for instance; yet well individuated objects should be enumerable.

Quine's unfavourable comparison of attributes with classes depends, furthermore, on a little cheating. For the impression is given that while classes can be accommodated by going down through their elements attributes can only be dealt with (in a comparable extensionally admissible way) by going up, through what they belong to: hence while (grounded) classes 'are well individuated' attributes are not because 'classes of attributes are as badly off as attributes' (p.5). It is plain however (what Quine says suggests it) that attributes may be distinguished through what has them. The attribute of heartedness is distinguished from that of kidneyedness by, e.g., possible (not to say actual) creatures with hearts which lack kidneys. More generally, if $(\Sigma x)\ (x \iota A \ \& \sim x \iota B)$, i.e. some possible object instantiates A but not B, then $A \neq B$, i.e. A is distinct from B. Moreover grounded attributes will reach bottom in particulars, which satisfy identity criteria exactly like those for Quine's well individuated physical objects: $x = y$ iff $(z)(z < x \equiv z < y)$. Venus is the same as Aphrodite because their parts (histories, etc.) coincide; Holmes is not the same as Moriarty because their parts go their separate ways.

The same points may be adopted to meet Quine's restatement of the issue in terms of open sentences (pp.6-7): 'the question of individuation of attributes [similarly classes] becomes in practice a question of how to tell whether two open sentences express the same attribute [class]'. Classes are again supposed to have the advantage over attributes (not on the way up but on the way down) - the advantage that makes or breaks, and renders those that fail unintelligible:-

> The desired formulation ... a satisfactory formulation which holds if and only if 'Fx' and 'Gx' determine the same class ... is of course immediate: it is simply '$(x)(Fx \equiv Gx)$'. It does not talk of classes; it does not use class abstraction nor epsilon, and it does not presupposes classes as values of variables. It is as pure as the driven snow. Classes, whatever their foibles, are the very model of individuation on this approach (p.7; my rearrangement).

In these times of increasing pollution even the driven snow is no longer so pure in industrialized places. The apparent purity vanishes once we start to analyze its contents. The intended content of '$(x)(Fx \equiv Gx)$' is: for every entity x, Fx iff (materially) Gx, i.e. the quantifier is restricted to entities. Thus if classes are not among the values of the variables the formulation is, even classically, inadequate, since many classes are not classes of individuals. It ceases to be evident too that we can, as Quine suggests, do nothing similar for attributes. Why not simply widen the scope of the quantifier to give '$(\Pi x)(Fx \equiv Gx)$'? This is modally pure: we can even rewrite it '$(\underline{x})(Fx \equiv Gx)$', and only the range of the quantifier is construed differently. It too looks pure enough.

But before we get carried away with this enlargement on the referential criteria Quine has offered us, it would be prudent to look critically at the conventional referential wisdom on class identity we have so far been dished up. Consider, for instance, the existential coextensiveness criterion, of which the pure formulation is (usually taken to be just) a reexpression. According to that criterion the classes {Pegasus, Quine} and {Quine} are identical, and the classes {Pegasus} and {Zeus} are the same, the same as the empty set, as are all classes of numbers should it happen that numbers do not exist. This picture is, the noneist submits, entirely mistaken. Class theory, properly formulated, works in a fairly satisfactory fashion for what does not exist; indeed its major applications are in the area of the nonexistent given that mathematical objects and purely theoretical objects do not exist. It would not work correctly if the existential coextensiveness criterion were right. For similar reasons the pure test is wrong. The truth "$(\forall x)$ (x pegasizes $\equiv$ x zeusizes)", for example, has the result that 'x pegasizes' and 'x zeusizes' determine the same class; but they do not, one determining the singleton {Pegasus} and the other {Zeus}.

§15. *Further objections based on theories of descriptions.* An almost endless series of objections to a theory of objects can result by drawing upon and varying principles of theories of descriptions tailored only to entities evidence that there are indefinitely many ways of infiltrating the Reference Theory: description theory is certainly a favourite strategy for so doing. Objections derived from description theory take however two strikingly different forms.

For a curious feature of objections to theories of objects is the vacillation (sometimes even in the one critic) between saying that a theory of objects is impossible, because for instance inconsistent, and saying that all the main assignments of a theory of objects can be absorbed and explained in an extension of classical theory. But the latter situation of course excludes the former by providing a classical model for the theory of objects, thereby ensuring its consistency. This curious phenomenon is exhibited especially with theories of descriptions; and an instructive example is provided by Tooley's objections to Meinongian semantics.

On the one hand, Tooley endorses the following principle of certain classical description theories.

DP. If $a = (\text{the } x)A(x)$ then $A(b)$ iff $a = b$,

which induces inconsistency in any theory of nonexistent objects with but few further assumptions. On the other hand, he (subsequently) proposes the following description scheme to account for what we are inclined to say about nonexistent objects:

TP. $((\text{the } x)A(x))f$ iff either $(\exists! x)(A(x) \,\&\, xf)$ v. $\sim(\exists! x)A \,\&\, \Box((\exists! x)A(x) \supset xf))$,

i.e. the A (is) f iff either there exists a unique x which is A and f or else there does not but it is necessary that if there exists a unique A then it is f.

TP does allow for some correct assignments to statements about nonentities, e.g. 'The golden mountain is golden'; unlike DP it permits a theory of a sort about nonentities. Indeed it enables counterexamples to DP to be designed, as the argument to inconsistency from DP will reveal.

The argument[1] to inconsistency is as follows: Let 'a', 'b' and 'c' name, respectively, these nonexistent objects: the golden mountain, the (exactly) 5000 feet high golden mountain and the 6000 feet high golden mountain. Then, using elementary principles of the theory of objects and obvious abbreviations:

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[1] The argument was suggested to Tooley by H. Burdick.

(1) $a = (\text{the (unique)}x)\ xg \ \&\ xm$

(2) $b = (\text{the } x)\ xg \ \&\ xm \ \&\ x5000$

(3) $c = (\text{the } x)\ xg \ \&\ xm \ \&\ x6000$

Applying the Characterisation Principle to b,

(4) $bg \ \&\ bm$

For by the CP, $((\text{the } x)\ xg \ \&\ xm \ \&\ x5000)g \ \&\ \ldots$. Hence by DP, (4) and (1),

(6) $a = b$

By parallel reasoning using (3) in place of (2),

(7) $a = c$, whence, by transitivity

(8) $b = c$.

But the properties of b and c differ, one being 5000 feet high, the other 6000 feet high (using the CP again); so by identity principles

(9) $b \neq c$,

contradicting (8).

The conclusion would be damaging indeed - namely that any theory of nonexistent objects is inconsistent - were the premises compelling. Unfortunately for the argument, however, DP has little to recommend it. What reason does Tooley offer? That it is normally accepted. Not even this is true. It is not a principle of basic free logic for example, which rightly restricts DP to *existent* a. (Free logic yields only the universal $\forall$-closure of DP). DP does not hold, for that matter, on Russell's theory of descriptions, without important qualifications. To ascertain these qualifications, consider an attempted proof of DP on Russell's theory. The antecedent expands to $(\exists x)(A(x) \ \&\ (\forall y)(A(y) \supset. x = y) \ \&\ x = a)$. Suppose, firstly, $a = b$; to show $A(b)$. Since $x = a$ for some given x, $x = b$. Also $A(x)$. But to conclude $A(b)$, requires that A be *transparent*. Suppose, secondly, $A(b)$ to show $a = b$. To use the uniqueness provision, it has to be taken for granted that *b exists*. Then, by instantiation $A(b) \supset. a = b$, whence $a = b$. The second qualification is the crucial one. For the argument to inconsistency depends upon applying DP (twice) where b does not exist. The argument fails, that is, even on Russell's theory of descriptions.

Really DP is a totally disastrous principle. By DP, if $a = IxA$ then, if $a = b$, $A(b)$. Take b as IxA. Then, if $a = IxA$ then $A(IxA)$, by contraction. Now take a as IxA. By reflexivity $A(IxA)$. DP yields, that is, an unqualified Characterisation Principle, and thus inconsistenty - irrespective of questions concerning nonexistent objects.

The other half of DP, which is the operative principle in the argument against nonentities, is only marginally better. The principle

(5) If a = IxA(x) then if A(b) then a = b,

is false, as the following sort of counterexample shows (the example is easily formalised on the theories of objects given or in other theories such as Parsons' theory):- Let a = the round thing, and b = the red round thing. Then b is round, but it is false that a = b. More generally (5) implies, what is false, that at most one object is nonexistent. Suppose there were two, b and c; $\sim bE$ and $\sim cE$. By (5) and reflexivity, if A(b) then $b \equiv IxA(x)$. Hence $b = Ix{\sim}xE = c$. (5) has at best severely restricted validity. One requisite restriction is already evident from the qualified form (5) takes in Russell's theory and on free logic: a further clause to the effect that b exists is required.[1]

Removing DP and (5) makes logical room however for Tooley's other objection from a rival theory of descriptions, that the theory of objects, though not now inconsistent, is unnecessary and the intuitions underlying it can be better accounted for through a variant reductive theory of descriptions, namely that encapsulated in TP above.

But TP is also inadequate. The following are typical objections to this Carnapian fix (a Carnapian fix being to take the Russellian theory in the unique existence case and to give an alternative where the unique existence clause fails):

1. it fails for intensional f, e.g. 'was thought about by Meinong';
2. it fails for logical f, e.g. 'is incomplete';
3. it sanctions ontological arguments. For example, on the analysis, the existent golden mountain exists, and, of course, the round square that exists exists.[2]

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[1] Strictly that is not all that is required. For principle (5) assumes a (over-) strong uniqueness requirement, so that the golden mountain, should it exist, must be one with the golden mountain further described. An interesting feature of the Tooley-Burdick argument is, in fact, that talk of entities could almost entirely replace talk of nonentities. An analogous argument with entities fails only at the very final step. Further determinations of entities do not change them (under the theory assumed); further determination of nonentities can change them - a significant logical difference.

[2] Proposals rather similar to TP appear in the literature, e.g. in Grossmann MNG, p.161, p.167, where it is asserted (falsely) that Meinong's claims are really about interrelations of properties; also in Dyche 76 and in Rapoport 78. A somewhat similar adaptation of Russell's theory of descriptions is to be found in Hintikka 59, and in the original version of EMJ.

Tooley presents TP as only illustrative however of ways in which features of nonexistent objects, such as their incompleteness, may be explained in a realistically satisfying way.

> A Meinongian semantics provides no explanation of why there are incomplete objects. A realist semantics, in contrast, by analyzing sentences purportedly about nonexistent objects such as the golden mountain into sentences which are about linguistic entities, such as predicates, or about intensional entities, such as concepts, or about real entities, such as properties, can provide an explanation of the features in question (p.4).

It is, in the first place, just false that a Meinongian semantics provides no explanation of why some objects are incomplete, of why the golden mountain is indeterminate as to altitude. Naturally it does not provide a reduction; but not all explanations, by any means, are reductions. Moreover reductive explanations, for what they are worth, can often be parallelled by nonreductive explanation in terms of the character of nonexistent objects, e.g. that they have their characterising features but lack extensional features that do not flow from their characterisation. Secondly, there are good grounds for scepticism as to the availability of reductions of the sort required. Despite much labour none has so far resulted. Indeed there has never been such an analysis of which one could truly say: that was close to successful. And there are simple theoretical reasons for supposing that no analysis can succeed. Take, for example the special case of propositions, a sort of nonentity. Since there are nondenumerably many propositions there is no hope of individuating them in terms of finitely many actual speakers and finitely many sentences - uttered sentences. That is, a linguistic reduction is precluded. But what of reductions of objects through concepts or properties? Noneists are not going to agree that such objects exist; such reductions, were they to succeed, would be only of objecta, bottom order nonentities, to higher order objects. Thus such reductions already suppose a theory of objects: they do not offer an alternative to it.

Certainly the idea is about - it appears e.g. in Grossmann MNG and Dyche 76 - that the distinctive truths of a theory of objects which flow from its characterisation postulates can all be somehow accounted for in terms of a picture of objects as systems of properties or natures. Such a simple picture is too simple: it is inconsistent without qualification. Moreover (as will also be seen in chapter 12), elaborating and working out the picture leads, as the development of the model through Parsons 74 and 78 shows, not necessarily to objections to theories of objects, but to more sophisticated and logically satisfactory theories of objects.

The reduction strategy is misconceived. Instead of trying to squeeze nonentities into preconceived moulds, which they do not fit, what is required is a phenomenological investigation - of how they behave, what features they have. Strictly the same is required of properties, since enough of their features remain obscure. A prudent course for anyone considering whether a reduction of objecta to properties or classes of properties could succeed, would be to investigate both classes first and then determine - ideally show - that a reductive analysis succeeded - or, more likely, failed. Reasons for suspecting failure - such as that nonentities are required to account for aspects of properties - are given in subsequent chapters (especially in chapter 12).

§16. *The charge that a theory of items is unnecessary: the inadequacy of rival referential programmes.* If however nonentities cannot be reduced then surely they are not needed - at least in what counts, science. It is indeed a very familiar objection to theories of items that they are unnecessary. Everything one really wants to say - everything that really needs to be said it soon becomes, when it turns out that much one wants to say cannot be said on the alternative proposals - can be said without all the dubious and metaphysically objectionable apparatus of a theory of items. We have encountered this sort of objection before, and shall meet it again in subsequent chapters where it will be answered along the following lines:- There is no satisfactory alternative to a theory which accepts leading theses of a theory of items if an adequate account of discourse is to be given. Alternative theories invariably leave out or distort much of what one genuinely wants to be able to say or to allow to be said. Nor is there any good reason to insist on such alternative, characteristically referential theories, once the Reference Theory and its elaborations have been seen through. For it is then apparent that though there are of course difficulties in working out how a theory of objects should be extended into new areas (where alternative theories have in any case seldom ventured), such as how the theory of items is to be appropriately combined with relevant logic, nonetheless a theory of items need involve no metaphysically dubious items. To insist that it does is to revert to referential thinking. Furthermore science is by no means all that counts philosophically. And even in the case of science nonentities are fundamental for an adequate account.

The formal mode reduction of discourse about nonentities, the Russellian reduction via a theory of descriptions, and Fregean style reductions to concepts, are only some among the many proposed ways of eliminating discourse about such "peculiar" objects in favour of honest-to-god referential discourse. Another favoured reduction programme, that undoubtedly has much appeal in the case of objects of myth, fiction and the like, is the elimination of nonentities that do feature in discourse by way of their (empirical) sources. The pull of such an approach Tooley[1] conveys:

> one surely feels that there is a reason why the Meinongian object, Sherlock Holmes, has the property of smoking a pipe, and lacks the property of smoking cigars. And the reason, surely, consists of certain facts about the world of existent things, facts about certain writings of Arthur Conan Doyle. But how are we to conceive of the relation between these facts about certain books, and the fact that the Meinongian object, Sherlock Holmes, has certain properties and lacks others? Is the relation a causal one? Or a logical one? Or something else? It seems natural to think of it as a logical relation, as some sort of entailment relation. But if facts about the world of existent things entail that there is a certain sort of Meinongian object, with certain properties, those facts about the existent world logically

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[1] Tooley says that the 'objection (78, p.4) was suggested by some remarks made by' Mortensen. Note that really it is not so much an objection, as a complaint that the Meinongian approach does not go "deep enough", together with a proposal for a further and perhaps rival programme.

> determine which fictional statements containing the name "Sherlock Holmes" are correct, and which incorrect. And in doing so, they provide a deeper account of the correctness and incorrectness of fictional statements - one that shows Meinongian objects to be, so to speak intervening variables.

But, firstly, this misrepresents the depth a theory of items can provide. Unless there is some intrinsic depth to referential accounts (there is not, though the impression that there is is often given), any depth of a referential approach can be at least matched by a Meinongian approach.[1] The Meinongian approach does not end - cannot satisfactorily end - with a statement of simple facts such as that a nonexistent object, Sherlock Holmes, has certain properties, e.g. he smoked a pipe but not cigars. There is always an account to be given of how nonentities acquire the properties that they have. In certain cases this will involve details of actual stories other cases theories, and so on. In some cases it may involve details of merely possible or conjectural stories. For the theory should be able to take account of the deeds of unsung heroes, just as it does of unstated propositions and unformulated theories - matters that make for very serious trouble for "realist" accounts. Indeed for this sort of reason a full reduction to actual source books is impossible.

Secondly, there are problems for any reductionist programme about the relations between source books and their objects. Granted that the relation between the source book(s), and the features of Holmes is a logical one (it is in fact a semantical relation), it is not, it seems certain, an entailment relation: Facts about the existent world do not entail Holmes smoked a pipe, or similar. Nor can an entailment relation be dredged up - without the insertion of some theory (about objects) - for the following sort of reason:- An empiricist-style logic such as Principia Mathematica (mark n model say) can incorporate all facts about the world (that an empiricist would wish to assert), but will nonetheless falsify (through the theory of descriptions) "Holmes smoked a pipe". So, there is no entailment.

Perhaps an elimination programme can succeed in other ways, e.g. through the semantical connections. These programmes, however they are elaborated, are bound to resemble programmes (to be examined subsequently), older and largely faulted programmes, for eliminating theoretical objects of science, and for eliminating discourse about universals; and they have about the same prospects of success, namely none.[2]

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[1] There is of course more than one measure of depth. Even so things are often said to be deep when they are not, but for instance simply difficult routes to something easily achieved in other ways. For example, a detailed Tooley-Mortensen reduction of fictional objects might be hard - very hard - to get right, but that does not offer any substantial reason to think that it would thereby be rendered deep. But the theory of objects, no matter how tortuous, never seems to qualify for any of the laudatory empiricist epithets, such as 'deep', 'solid', 'sound'.

[2] See further chapters 10 and 11. The programme of eliminating universals in favour of a first-order logic, for example, demonstrably fails. Where reduction programmes can succeed after a fashion, as in the case of the elimination of the intensional in favour of the extensional, explanatory power, and thereby depth, are sacrificed.

4.15 THE COMMONSENSE RECIPE FOR MEETING OBJECTIONS

In conclusion, there is a general guide - it is hardly to be expected that it be fully effective - to meeting objections to the theory of items that is worth recording; namely, give the common sense response. The reason that such a procedure works well is that the theory of objects is, as we will come to see more clearly in subsequent chapters, much closer to common sense than its main opponents, the Reference Theory and its reductionistic variants. Furthermore, any opponent of the theory of objects would be well-advised, before he levels the accusation that the theory of items leads to weird results, to consider whether his own theory does not lead, when followed out, to conclusions that are far stranger, and further removed from common sense, than any that the theory of items entails. The main alternative theories that have been worked out in much detail in modern times lead in such directions - consider, for example, the atomism of Russell and the early Wittgenstein; the extravagant elimination by the logical positivists of much ordinary discourse as nonsense; the scepticism about translation and the flight from intensional discourse and wipe-out of substantial parts of it by Quine. So also do other less fully worked out theories - consider, for instance, the surprises Kripke has for us; the disastrous conventionalism of Carnap and the later Wittgenstein; the underlying empiricism and nihilism of ordinary language philosophy. Well may one look upon these modern referential works and despair. At least however be warned before too lightly dismissing the nonreferential alternative offered by the theory of objects.

CHAPTER 5

THREE MEINONGS

The three Alexius von Meinongs, of theory of objects fame, to be considered are the unhistorical Meinong, that is the mythological Meinong of mainstream philosophical literature, the consistent Meinong, and the paraconsistent or dialectical Meinong.[1] At most one, and perhaps none, of these Meinongs actually existed, and certainly the first mythological Meinong never did exist. The primary task in what follows is not however the historical one of trying to determine, if it can be determined, which if any of these or other Meinongs did exist (though this is not without importance, and is attempted in section 5), but to continue the on-going case for and assessment of Meinong's theory of objects and near relatives to it, and to begin on assessing the case for the dialectical Meinongian position vis-á-vis the consistent one.

§1. *The mythological Meinong again, and further Oxford and North American misrepresentation.* Meinong has been presented in the recent history of philosophy as a philosopher with weird and peculiar theories far removed from commonsense, as a philosopher whose position was to be avoided at any cost, so that mere association of a position with that of Meinong was on its own a conclusive refutation of it, as a warning to all of what would befall them should they be tempted into following his path into the jungle. Meinong's theories encountered heavy opposition from their inception, so much so that in later works Meinong had already unduly modified and weakened some of his claims, e.g. those concerning the character of impossible objects (see e.g. EP). The opposition to Meinong's theories, and increasing misrepresentation of them, were no doubt encouraged by remarks of James and by the platonistic picture of Meinong's theories into circulation by the later (post-1918) Russell.[2] But the really serious misrepresentation of

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[1] Although we shall talk about the consistent Meinong, the dialectical Meinong, and so on, really each description covers a cluster of positions. Subsequently, in chapter 12, substantive issues other than the consistency and coherence of the position of the historical Meinong will be taken up, and this will lead to the consideration of various allegedly historical Meinongs. Particularly important as regards Meinong's theory of objects is the question as to how Meinong understood his objects: were some of them genuine individuals, or were they really natures, complexes of properties, or some such.

[2] Though Chisholm notes (in 72, p.34, note 12), and Griffin argues in detail in 77, that Russell was rather scrupulously fair to Meinong in his earlier expositions of Meinong's theories. This is not Findlay's view (63, pp.xi-xii):

> Unfortunately Russell was far too concerned to advance from Meinong to his own notions and conclusions to bother to get Meinong quite straight, and the accounts he put into circulation of Meinongian contents as consisting of sense-data and images, and of Meinong's non-existent objects as 'subsistent', are simplifying travesties of Meinong's complex opinions.

Findlay does adduce several rather convincing pre-1918 examples in the course of 63, e.g. p.84, p.94. A careful reader will find other examples in Russell 04.

Meinong's thought in the English-speaking world began, it seems, not with Russell but with the Oxford philosophers, and especially Ryle. It is from Oxford philosophers that the main misrepresentation of Meinong's position, and the presentation of Meinong as a figure of fun, as a philosophers' Aunt Sally, has come. This picture, according to which a central thesis of Meinong's theory of objects is that all objects have some kind of being, is very far from accurate. But it has persisted. And it has been modified only slightly by philosophers of the Bergmann school, such as Grossmann MNG, who still see Meinong as a super-platonist, as an entity-multiplier par excellence (even if a serious philosopher with some decent reasons for his claims).[1]

Major attacks on Meinong's position and substantial misrepresentation of his position, have come, not too surprisingly, from a reductionist, and usually empiricist, opposition. The misrepresentation has come primarily from philosophers who are locked into a framework of assumptions that Meinong would have rejected, chiefly facets of the Reference Theory such as the Ontological Assumption (as, for example, the Oxford philosopher Hinton whose criticism of Meinongianism was assessed in chapter 4). It is an easy step from seeing, on the basis of such a framework, a nonreductionist theory such as Meinong's as saturated with the systematically misleading, to systematic misrepresentation. And this is what has happened. Even Findlay, who has given us a fairly sympathetic overview of Meinong's work, slipped in his later appraisal of Meinong (written under Ryle's influence) into using the very misleading terms of the opposition, into seeing Meinong as the introducer of entities (63, p.327, p.333) and as having 'a world too rich in forms of intensionality and overpopulated by objects' (p.326). But the horse population of the world comprises the horses that exist. Pegasus does not exist, so Pegasus does not belong to the horse population of the world. Similarly nonexistent objects do not belong to the population of the world. The world may be overpopulated, but it is not "overpopulated" by nonexistent people.

The unhistorical criticism of Ryle (who plays the role of arch-villain in the first act of this melodrama) is more serious. Ryle's initial diagnosis of how it is that the theory of objects is fundamentally mistaken depends upon associating it with the doctrine of terms. Ryle claims (33, 71, 72) that the theory of objects is founded on the traditional doctrine of terms, the whole structure of which is rotten. Meinong's main service to the philosophical community was a reductio ad absurdum of this traditional doctrine; by taking it to its absurd extreme, he showed the rottenness of the whole structure. Ryle's case however depends on several assumptions - which fail. Firstly, Ryle's case depends upon expanding the doctrine of terms, and assigning to Meinong theses from the expanded doctrine that he never held. According to the traditional doctrine of terms, every term stands for, or designates, an object. This thesis Meinong did adopt (though with qualification in the case of defective objects: see §3). It was not however part of the traditional doctrine of terms, or of Meinong's view, that every object so designated existed or had being of some sort (Mill makes this very plain: see 47). But Russell and Ryle attributed such a view to Meinong (e.g. Ryle 'The Platonizing Meinong', 72, p.7), and it has stuck. It was not part of the traditional doctrine of terms that the designation of a term is its meaning; it was certainly not part of the doctrine that the meaning of any expression at all was some designation. Nor was it Meinong's view: Meinong made the elementary distinction between what a term expresses and what it designates. Yet it is a favourite criticism of Ryle's that Meinong accepted, what the doctrine of terms included, the 'Fido'-Fido (or reference) account of meaning (thus e.g. 'the lid of ... the "Fido"-Fido box ... was never even lifted by Meinong' 72, p.7). It was not part of the traditional doctrine of terms that every expression occupying a subject position in English is a term, in particular quantified subjects with 'everything' and 'something' were not traditionally accounted terms, nor were auxiliary expressions such as 'the sake'. (Ryle's crack 72, p.14 that 'Lewis Carroll would not have amused them [Meinong and Husserl], or therefore, taught them' is accordingly misdirected.)

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[1] Grossmann's misrepresentation of Meinong will be examined elsewhere; a small beginning only on this task is made in chapter 12.

Secondly, Meinong did not accomplish a reductio ad absurdum of the traditional doctrine, nor has such a reductio ever been accomplished without additional assumptions which go well beyond the doctrine of terms. (Nor, as logical investigations show, can a reductio be accomplished; for the main theses of the doctrine of terms can be satisfactorily modelled, in a way evident from 1.24). Meinong had no reason then to stand back and say, as Ryle believes those who were right said, 'but this is ridiculous' (72, p.14).

Ryle's later diagnosis of the error of Meinong's ways - included in his premature obituary note for the theory of objects - was that the main error was that of nominalisation, and the treatment of the results as logical subjects (72, especially, p.12), and that the solution lay in Brentano's and especially Russell's

> systematic and strategic de-nominalisation. The principle of their mutinous reaction was that wherever possible - and wherever anything was at stake - the contributions made to sentences by words and phrases must be shifted away from the 'Socrates'-place and into the predicate-place (p.12).

Ryle should have realised that the method of avoiding nominalisation by predicate paraphrase could not succeed generally. For if it worked higher-order predicate logic could be reduced to first-order logic, to take one blatant example of failure; similarly set theory could be reduced to virtual set theory. That some sample cases may be more or less paraphrased - all Ryle has ever offered by way of justification of his extensive claims - does nothing to establish a general reduction. When it comes to preserving sense, point and force of claims - preservation of which would require substitution salve veritate in decidedly intensional contexts - comparatively few of the nominalising operations that English affords can be discarded without loss. Ryle's reduction programme, for eliminating a wide range of "systematically misleading" nominalisations, is impossible, and not merely in isolated cases. Moreover from a Meinongian point of view the whole reduction, and systematic elimination, programme is misconceived. For it is based in large part on an assumption of ontological reduction, that by eliminative means existential commitments can be removed, since, by the Ontological Assumption, the subject places eliminated carry existential commitment. But the underlying assumption is mistaken: use of a term in a subject place carries no commitment to the existence of what the term is about.

5.1 THE INVALIDITY OF RUSSELL'S ARGUMENT TO INCONSISTENCY

Misrepresentation of Meinong by no means ends with the representation of Meinong as a super-ontologist or super-nominaliser who took all his (weird) objects to exist, or subsist, in some way. No less pernicious, and more serious (since platonism is not usually accounted trivial), is the very different assumption that Meinong's theory is bound to be inconsistent - indeed that any theory of nonexistent items is bound to be inconsistent - an objection emanating from Russell. And hardly less damaging and waylaying to attempts to systematise a theory of objects is the proposition, forcefully expounded by Quine, that nonexistent objects are incorrigible and that no worthwhile theory can contain them - a proposition that has frequently been used against Meinong's theory, without any proper account being taken of Meinong's distinctions and classifications of objects.[1]

Both these sorts of dismissal of Meinong, and of theories of objects, have been circulated from Oxford, as if furthermore the objections were entirely fatal. Thus, for example, Kenny 68 reiterates, as insurmountable, the objections to nonentities that Quine tries to manufacture from issues as to identity and similarity of such objects (objections considered in chapter 3). More telling is the line emanating from Russell. Russell is said by Lambert (72, p.37) to have argued (in OD) that any theory which admits nonexistent objects is inconsistent. A more modest version of this thesis - qualified to: any theory respecting ordinary language - (Carnap MN, p.65) also derives from Russell. At least in his main argument in OD Russell makes no such sweeping claims as to the inconsistency of any theory (or, what is even less likely given Russell's attitude to ordinary language, any theory respecting ordinary language) which admits nonexistent objects. Russell's claim is that 'such objects, admittedly, are apt to infringe the law of contradiction' (p.45) and that the objects of the theory of Meinong [and, strictly, his students Ameseder and Mally] do break the law. But subsequently, in his discussion (p.54) of McCall's division of individuals into real and unreal, Russell equates any theory which assigns nonentities (unreal individuals) as the denotation of significant subjects (which on his view do not denote anything) with Meinong's theory, and so to be rejected as conflicting with the law of contradiction. In short, Lambert is right (except perhaps for the bit about arguing). The invalidity of Russell's argument is striking enough once the argument is exhibited. For to derive an infringement of the law of contradiction from a theory of nonentities in Russell's way, further assumptions have to be pumped in - assumptions about assumptibility and negation, which (though they are commonly taken to be part of Meinong's theory) are not part of Meinong's developed theory, and which are certainly not part of alternative theories of nonentities, some of which are demonstrably consistent (as Lambert 76 and others have explained, and as Parsons has now shown, in outline, in the case of a sophisticated theory of nonentities, with much in common with Meinong's mature theory: see his 78 IV).

But the myth that any theory which admits nonexistent objects is inconsistent or absurd persists, at least at Oxford, as Dummett's work reveals:

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[1] Though misrepresentation of a position and objection to the position are commonly enough quite distinct, there are other cases where there is no easily discernible line between the two.

> ... absurdities result from adopting the view of Meinong - and early Russell - that there are objects which do not exist, objects which are not actual, but merely possible, ... (Dummett 73, p.197).[1]

Furthermore,

> ... as Meinong's experience showed, we run into uncomfortable antinomies when we try to lay down the truth-conditions for statements about possible objects (73, p.386).[2]

What is the argument for these claims, from which major logical conclusions are drawn? Sandwiched in between the claims (with intervals of about 100 pages either side), we find (73, pp.279-80) a repetition of Russell's argument (discussed in Findlay 63, p.104 ff.) that Meinong's theory enabled novel applications of the ontological proof:-

> The most telling objection to the thesis that 'exists' is a predicate which applies to some things but not to others derives from the experience of Meinong in his ill-fated attempt to maintain that thesis.[3] The thesis goes, of course, with taking our expressions of generality as ranging, not only over actual, but also over merely possible (and, in Meinong's case, also over impossible) objects, and with the taking of names which lack an actual referent as standing for a merely possible (or, again, perhaps an impossible) one.[4] In that case, we are faced with the problem when a predicate is to be held to apply to a non-existent object: and the answer which forces itself on us is that it must apply whenever its doing so follows from the mere sense of the name of the object.

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[1] It is important to observe that Dummett does not make similar objections to platonism, and that similar objections are not usually made to platonism, since it is widely recognized that (properly) qualified platonism is at least a consistent doctrine.

There is then a tension between the representation of Meinong as inevitably embroiled in an inconsistency and of Meinong as a super-platonist, that some critics have failed to observe.

[2] Unless the second claim is little more than a repetition of the first, it is farfetched. Meinong's experience did not appear to include anything that would be counted as 'laying down truth-conditions' in the modern sense.

In any case, truth-conditions for elementary theories of non-entities can be laid down without encountering antinomies of any sort.

[3] The inaccuracy of this attribution emerges from Findlay 63, p.105 and p.176.

[4] These connections are not necessary, or even universal. Free logics counter some of the connections, the taking of existence as a universal property another, one of Meinong's positions another.

> It is precisely from making just this move that ... the ontological argument starts. But now, if 'exists' is a predicate like any other, there is no reason why the requirement of satisfying this predicate may not be incorporated into the sense of some complex name; indeed, there is nothing to prevent us inserting at the beginning of any definite description, the word 'existent': and it will then appear that we are committed to the thesis that true sentences result from putting any such complex proper name into the argument place of 'ξ exists', i.e. that the referents of all these complex names exist (emphasis added).

Thus, to use Russell's examples, the existent present King of France exists (and also does not exist), and the existent round square really exists. The fundamental flaw in Dummett's argument is exhibited in the italicised assumption (an unqualified version of the Characterisation Postulate). Such an answer did not force itself upon Meinong, or upon earlier or more recent investigators of theories of non-existent objects; and there are excellent reasons for not giving such an answer. It follows from Meinong's developed views that we cannot make existence, or any other sort of genuine being (i.e. being carrying the modal moment), part of the nature of an object (cf. 63, p.105). The argument from the sense of 'the existent ξ' to the truth of "the existent ξ exists" accordingly fails, because existence is not a characterising, or nuclear, feature, and so not assumptible. Dummett has done nothing to refute theories of nonexistent objects, other than the very naive ones Russell had already disposed of, and nothing to demolish Meinong's considered views; indeed Dummett has not bothered to take account of these views.

It is not, of course, being suggested that misrepresentations of Meinong's position now emanate only from Oxford. The picture of Meinong as a super-platonist has had much philosophical coverage in many places, particularly in the American mid-West,[1] and the idea that Meinong was bound

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[1] Examples abound, especially in publications of the Bergmann school.

A recent striking example is Lycan 78, where the paradigm of Relentless Meinongianism, which is equated with Meinongian realism, is Lewis's Democritean theory of alternative existing worlds, and where Meinong is portrayed as a theorist whose ontology included all sorts of nonexistent objects. Relentless Meinongianism is intended (like Hinton's resolute Meinongianism) to be an irreducible form of Meinongianism, which (unlike Hinton's Meinongianism) takes as primitive non-standard Meinongian quantification and a nonuniversal existence or actuality predicate. Unfortunately for Lycan's unconvincing attempt to assimilate Meinong and Lewis, as relentless Meinongians separated by mere terminological differences, even the primitive logical apparatus is interpreted very differently (not to mention other things). Lewis's quantification is standard, not neutral; his objects of quantification are existent beings which are consistent and complete; and his actuality predicate simply effects a partition of these entities which separates out those of one world. Meinong's neutral quantifiers *are* non-standard, the objects of quantification include many objects which have no existence or being at all, and very many of which are incomplete or inconsistent (and not fully assumptible) and so could not exist. Furthermore all of Meinong's objects

(continued on next page)

to accept, and did accept, an unqualified Characterisation Postulate is also alarmingly widespread. The more common style of misrepresentation is exemplified by the following invalid argument - a some to all argument - of Linsky (77, p.33: similarly Lycan 78):

> Meinong uses the example of the gold mountain which both does not exist and is made of gold. This commits Meinong to the universal validity of the formula $\phi(\iota x)(\phi x)$.

No such thing: all the premiss establishes is that Meinong accepted $\phi(\iota x)(\phi x)$ for some ϕ. Linsky's other argument that Meinong was committed to the universal validity of the principle is different but no less fallacious: it is (p.34) that the insistence that '$(\iota x)(\phi x)$' denotes $(\iota x)(\phi x)$ 'entails that $\phi(\iota x)(\phi x)$ is always true for any choice of ϕ'. Again no such thing, without the further naive, and mistaken, assumption that the

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[1] (Footnote continued from previous page.)

are in the object-domain of the actual world, and true unmodalised statements can be made about all of them. It is not just that the objections made (in chapter 4) to attempts to convict Meinong's theory of platonism apply against Lycan's "terminological" transformations - transformations which fail to preserve philosophical positions, and which commit the cardinal ontological sin of converting 'is an object' into 'exists' - but that Lewis's world-partitioned universe, the logical theory of which may be classically formulated, differs drastically from anything genuinely Meinongian.

Because the terminological transformation fails some of the drawbacks to relentless Meinongianism which Lycan enumerates, which are objections to Lewis's theory, fail to apply to Meinongian theories. And others are easily met. For example, nonentities cannot be (classically) met by entities (or counterparts encountered by their real life originals) because of the Brentano condition, that entities cannot stand in entire physical relations to nonentities; and knowledge of nonentities is obtained by reasoning from their respective source books. Which leaves just one objection, which Lycan repeats over and over, namely that what amounts to neutral quantification is taken as primitive, is not reducible (to referential quantification) and (so) is literally unintelligible. While it certainly is referentially irreducible - it can be defined, e.g. in the lambda theory, but only presumably in ways that would generate parallel objections - unintelligibility is not a consequence. For analogous objections could be made to referential quantifiers, which are ultimately explained in terms of natural language quantifiers. But non-referential quantifiers can be similarly explained, e.g. in terms of 'every' and 'some'. This reveals that the unintelligibility of neutral quantifiers is not the real issue, but only symptomatic of the opacity to reference theorists of the Meinongian notion of object or thing. For the neutral quantifiers can be explained exactly as Quine explains his quantifiers (which Lycan finds intelligible): '(Px)' reads 'for some thing x' and '(Ux)' 'for every object x' (cf. Quine, e.g. 59, pp.83-85). All that differs is the range of objects encompassed (Quine's being restricted to referents, i.e. transparent entities, or in more old-fashioned terms, clear and distinct entities). So Lycan's objection boils down to an objection to the neutral notion of 'object': but such objections have already been dismissed in Chapter 4.

object denoted is, because presented as the object which is ϕ, ϕ. What does require more work to counter is Lambert's contention (76, p.253) that Meinong imposed no restrictions on the Postulate, and indeed that there is abundant textual evidence that this is so. This appears misinformed. Lambert rashly relies upon work Russell was supposed to have had available; but part of Russell's case against Meinong - the argument concerning the existent King of France - rested not on Meinong's theory but on what one of his pupils had said, and Russell's early work of course took no account of Meinong's mature thought. There is, moreover, clearcut evidence from Meinong's later work that the Characterisation Postulate was restricted (cf. also 4.7).

The evidence comes firstly from Meinong's doctrine of the modal moment (explained in Findlay 63, p.102 ff),[1] in terms of which Russell's objection that the theory of objects generates ontological proofs (e.g. novel proofs that impossible objects exist) is met:

> ... the pure objectum is indifferent both to being and non-being; these distinctions come to it from outside, and are only to be found in objectives which concern it. It follows that, strictly speaking, we cannot make existence, or any other sort of being, part of the nature of an objectum. ... genuine existence does not belong to the sphere of so-being (63, p.105).

Thus, for example, the existent round square (though it has, so Meinong allows, suppositious existence) does not exist because its existence lacks the modal moment. Furthermore

> we cannot, by means of a judgement or an assumption, attribute the modal moment to an objective [or object] which does not possess it (63, p.107).

Put differently, predicates carrying ontological-style commitment (e.g. existence or factuality) are not assumptible, the properties they specify are not characterising, not part of so-being.

The difference indicated, between properties which can be part of the nature of an object and those which cannot be (but which are, for instance, founded on the nature of the object), is consolidated in Mally's and Meinong's distinction between nuclear and extranuclear properties. Extranuclear properties, such as existence, determinateness and simplicity, are not, to put it bluntly, assumptible: the Characterisation Postulate does not apply without important restriction where extranuclear properties figure. As far as restrictions on the Postulate are concerned, the second piece of evidence deriving from Meinong's deployment of the nuclear-extranuclear distinction (on which see 63, c. p.176), supersedes the first piece deriving from the modal moment since, logically important though the modal moment is, the property distinction alone, properly applied, is enough to meet all objections to theories of objects based on illegitimate appeals to the Characterisation Postulates. The Meinong whose theory includes an unrestricted Characterisation Postulate is accordingly, like Meinong the super-platonist, a mythological Meinong.

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[1] The doctrine is presented in Mög, chapter 37; but Findlay's presentation is more accessible.

§2. *The Characterisation Postulate further considered, and some drawbacks of the consistent position.* The separation of the consistent paraconsistent Meinong also comes with the Characterisation, or Assumption, Postulate, according to which an object has all its characterising features, i.e. in the form which will be of main concern, $(\tau x xf)f$, where f is a characterising (or nuclear) property and τ an appropriate singular descriptor. The Characterisation Postulate certainly has to be properly qualified if inconsistency, and also triviality, are to be avoided; indeed the Postulate has been perhaps *the* main problem in working out a consistent Meinongian theory, since other postulates, e.g. those of neutral quantification theory, all admit rather obviously of elementary finite modelling. The problem, in determining requisite qualifications, consists primarily in working out what counts as a characterising feature (this was, as we have seen, one of Meinong's later problems also).

It might be thought that the Characterisation Postulate is simply a special problem for Meinongian theories and that the Postulate and its difficulties can be done away with entirely in classical theories. This is not so. The Ontological Argument and its variants remain to vex classical logical theory. Moreover, there is no question of doing away with the Characterisation Postulate classically: it occurs in an important form in classical theories, e.g. in Hilbert's ϵ-scheme $(\exists x)(f(x) \supset f(\epsilon x f(x)))$, in Fregean description theories (see, e.g. Kalish-Montague 64, pp.242-3), and in the scheme $E!\, \iota x f(x) \equiv f(\iota x f(x))$ of Russell's theory of descriptions (cf. PM *14.22). Thus according to Russell it is true that the man who wrote *Waverley* wrote *Waverley* but false that the man who squared the circle squared the circle. It is *very* doubtful that untutored logical intuition would agree, but the matter has perhaps ceased to be one of hard data. Nor is the question of the restrictions on the Characterisation Postulate without difficulty classically. The case of sets is enough to establish this: for set-theoretically the restrictions on the Characterisation Postulate amount classically to the restrictions on the set abstraction axiom, i.e. on set existence, as we shall shortly see.

An easy way out of difficulties might seem to be to simply follow the classical lead and not impose any characterisation postulates for nonexistent particulars. This would, however, amount to abandoning the Meinongian enterprise, to giving away the claim that the golden mountain is golden, and the round square both round and square, and more important to abandoning the seemingly correct thesis that nonentities have more or less definite natures and that different ones has distinctive characters. More important, it would be to renege on the commonsense basis on which the theory of objects is built, according to which nonentities can be distinguished and do have properties. And given the defensible commonsense basis, it emerges by transcendental arguments that limited characterisation postulates hold for nonentities (see chapter 6).

Such transcendental arguments yield, however, only limited information regarding properties of nonentities. They do not indicate how properties other than those supplied by characterisation are arrived at; they do not indicate *which* of the extensional properties that a nonentity says it has in its own description, for example, it has. Which such properties nonentities do have, which properties are *characterising*, will have to be determined or delimited, by somewhat independent arguments;[1] and on this issue theories of objects split. A most important split is into consistent and dialectical theories.

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[1] (Footnote on next page).

Let us consider first consistent theories, and the sorts of restrictions imposed on characterisation postulates in such theories. The first stage of the logical theory of the consistent Meinong can be obtained by a fairly simple reinterpretation and enlargement of classical logic. The logic of (first-order) quantificational theory can remain exactly the familiar syntax, though to emphasize the fundamental semantical changes, and because the usual quantifiers are wanted for their usual (though now defined) role, it pays to adopt new notation for the neutral quantifiers. In place then of the referential quantifiers $\forall$ and $\exists$, let us use the neutral quantifiers U (for every) and P (for some). Neither ordinary language quantifiers nor those of quantification logic need be restricted by the existence and identity requirements that classical logicians have tried to impose in their regimentation of discourse, to suit the demands of an empiricist philosophy. The removal of classical regimentation greatly increases the scope of application of the logic, what can be said using it, and the arguments that can be formalised with it, and several problems simply disappear with the reinterpretation.

A conspicuous difficulty for what we are generously calling the 'consistent theory' is to make such apparently[1] inconsistent assertions as that the round square is round and also not round, because square, emerge from the Characterisation Postulate. A solution to this problem, and thereby a consistent theory, is obtained by making, in one way or another, a distinction between sentence and predicate negation (in the modelling of Parsons 74, for example, predicate negation is taken as property negation). The distinction - reflected in symbolism naturally enough as the difference between ~xf and x~f - enables such objects as the round square and the round nonround to be incorporated in a consistent theory. For consider the round nonround, i.e. in obvious notation $\iota x(xr \& x{\sim}r)$. By the Characterisation Postulate, the round nonround is round and the round nonround is not round, i.e. $(\iota x(xr \& x{\sim}r))r \& (\iota x(xr \& x{\sim}r)){\sim}r$. No violation of consistency results because y~r does not imply ~yr when y is inconsistent, i.e. predicate negation cannot be converted generally into sentence negation. "The round nonround is not round" does not imply, and so does not mean, "It is not the case (it is false) that the round nonround is round". What - one soon asks or, should one neglect to do so, the opposition soon enough asks - about the object that is round and is such that it is not the case that it is round, i.e. more clearly in symbols, $\iota x(xr \& {\sim}xr)$? According to the consistent theory the Characterisation Postulate does not apply in such cases: if it did inconsistency would of course result with $zr \& {\sim}zr$ where $z = \iota x(xr \& {\sim}xr)$.[2]

(Footnote from previous page)

[1] Those mentioned below for various different cases - for abstraction principles, for the case of entities, and for the cases of nonentities (cf. 1.21).

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[1] Someone may doubt that the consistent theory really includes impossible objects. In one good sense it does (that the existence of the objects would yield a contradiction), in another good sense it does not.

[2] In the more restrictive setting of Parsons' modelling 74, such objects as z cannot be formed. Since such objects can readily be introduced using natural language this is a limitation of the modelling, if an advantage from the point of view of ensuring consistency.

Such a restriction on the Characterisation Postulate may appear arbitrary, but it is not. It is based on the old idea that an item cannot be (properly) characterised negatively, in terms of what is absent from it; that genuine characterisation should be positively achieved in terms of what properties or their opposites items have. In these terms, predicate negation, which introduces opposites, is a positive operation along with conjunction.

There are other ways of arriving at similar restrictions on the Characterisation Postulate. One way emerges from the extensionality restriction (soon to be considered): looked at one way negation is not a fully extensional matter, so sentence negation should be excluded in characterising an object.[1] More important are the general reasons already alluded to that we shall come back to in arguing for the general qualifications that go with characterisation postulates: that one is only free to determine what is open to determination, and that consistency like other less global features of the actual world is not so open to determination.

These sorts of explanation - though of a similar order of merit to that given in explaining why the Characterisation Postulate is restricted classically to existent objects - are not entirely satisfying. It looks a bit as if Meinong's theory has been rendered consistent by formal chicanery, when its natural tendency is perhaps, as Russell thought, to inconsistency.[2] Is there really so much difference between $\iota x(xr \,\&\, x{\sim}r)$ and $\iota x(xr \,\&\, {\sim}xr)$, so that the first object is round and not round and the second is, at best, round, and its inconsistency shown only indirectly (e.g. by a reductio on the supposition that it exists, or by a qualified Characterisation Postulate for possibilia)? Consistency is (as always) purchased at the price of restrictions on what can be said, to the detriment of what ought to be truly sayable. The cost of these restrictions appears in a sharper way with paradoxical or defective (as Meinong called them) objects, such as Russell's class and the statement that this very statement is false, than with inconsistent items such as z. In the case of many paradoxical items, most of us, before instruction anyway, do want to apply the Characterisation Postulate, to obtain from the Liar statement $\iota p(p \leftrightarrow Fp)$, the equivalence $T(\iota p(p \leftrightarrow Fp)) \leftrightarrow F(\iota p(p \leftrightarrow Fp))$, whence (by Excluded Middle, and the Tarski biconditionals, $Tp \leftrightarrow p$ and $Fp \leftrightarrow {\sim}p$), $p_1 \,\&\, {\sim}p_1$, where $p_1 = \iota p(p \leftrightarrow Fp)$. What is more we can argue rather convincingly - by the paradox arguments themselves - for the contradictory conclusion reached by application of the Characterisation Postulate. So why restrict the Characterisation Postulate to exclude the result of these apparently valid arguments (which are not however really independent of the Characterisation Postulate)? And why not attempt a uniform treatment of paradoxical and impossible objects? Indeed why not. But before answering the questions, it is of historical interest to (try to) see where Meinong stood.

§3. *Interlude on the historical Meinong: evidence that Meinong intended his theory to be a consistent one, and some counter-evidence.* It is at least clear that Meinong's theory of objects is unclear and indeterminate in several crucial logical respects, most notably in the matter of eventual restrictions on the CP, but also as to issues such as identity theory (see further 12.2). Is it that the historical Meinong is also indeterminate between the consistent Meinong and the paraconsistent Meinong? Apparently not, but it is hard to be quite sure.

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[1] The detailed argument depends on defining extensionality semantically in terms of no world shift (even to reverse worlds), and observing that negation evalutation in relevant logic involves a shift to a reverse world.

[2] Perhaps the natural tendency of an adequate theory is to inconsistency?

The chief evidence that Meinong was prepared to endorse contradictions as true is sometimes said to come from a frequently-cited passage where Meinong is replying to Russell's objection that impossible objects such as the round square are apt to infringe the law of contradiction. According to Meinong,

> the principle of contradiction is to be applied by no-one to anything but reality and possibility (Stell, p. 16).

But if a contradiction were true, af and ~af were both true for some statement (which can be given the form af), then reality would not remain unscathed, inconsistent statements would both be true. Thus if the principle of (non)contradiction, in this form, applied, without qualification, to reality a contradiction could not be true. This was not however what Meinong meant. Meinong was not denying non-contradiction in the semantical (or in the propositional) form, he was not contending that some propositions are both true and false. The logic of objectives, Meinong's replacement for propositions, was two-valued: objectives either obtained or they did not, and no objectives both obtained and did not. This is important evidence that Meinong had not contemplated, or really allowed for, paraconsistency.

In the given context 'reality' concerns what exists, not what is true, and is better replaced (as in Findlay's rendition 63, p. 104) by 'actuality'. What Meinong meant, so it was previously argued, was that the traditional principle, asserted of objects, that no object both has and lacks some one property, applies at most to existent and possible objects. Hence his subsequent elaboration of the point, that exceptions to logical principles that are confined to impossible objects are not important limitations (Mög, p. 278). Hence too his choice of examples (in Stell and Mög), of objects such as the round square, which are simultaneously round and not round, i.e. which satisfy predicates and their negations.

In defence of Meinong's claim, it is worth reiterating that the typical, and Aristotelian, applications of such logical principles, and also standard defences of them, occur in settings where existential presuppositions are made and where restrictions to entities are commonly assumed. However, to a large extent, Russell and Meinong were at cross purposes. Russell's rejoinder to Meinong (05, p. 439) was that Non-Contradiction is asserted, not of subjects, but of propositions; but this evades part of the issue. For Meinong was concerned with the traditional formulation in terms of subjects, which had wide currency at the time Russell was writing. Moreover, Russell's own theory allows violations of such traditional forms, violations of Excluded Middle in the case of nonentities (e.g. the present King of France is bald and also not bald), and of Non-Contradiction in the case of classes, violations that are quickly said to be apparent because they disappear when class and object talk are translated into entity talk. Meinong could allow for impossible objects in a similar way - except that logical violations are not merely apparent - in effect, through a theory of predicate negation, the rudiments of which are to be found in his work. The Law of (Non)Contradiction that no one would expect to hold for impossible objects was a predicate negation formulation of the principle.

In sum, the evidence does little to establish the alleged conclusion, to show that Meinong had moved outside the intended framework of a consistent theory of objects, but if anything helps to confirm the contrary impression.

Other major evidence comes from Meinong's examination of paradoxes. Meinong considered the logico-semantical paradoxes (EP, p. 10 ff.), but he never really contemplated a paraconsistent assimilation of these paradoxes.[1] Thus he saw the Russell paradox as a dilemma to be resolved (p. 11 bottom), and as 'easily resolved if a rigorous interpretation of the situation is given' (p. 13). Even if Meinong's method of resolution of the Russell paradox is rather opaque (it is a curious blend of elements later worked out by Lesniewski, by Ryle, and by others), the upshot of the resultion for paraconsistency is clear. Nothing self-contradictory is left; contradiction is dissolved by the time-honoured method of locating a difference of respect:

> all that it means, in the end, is that two objects may be similar in one respect and dissimilar in others. Black and white are different from each other; neither of them can be predicated of red or blue; in this respect they are similar.

It is the same with some of the semantical paradoxes which do force Meinong a little closer to a paraconsistent position, and really into a difficult corner. Consider what Meinong says of Mally's problem: whether a thought about a thought which is not about itself is about itself.

> A thought which is at once about itself and not about itself is indeed peculiar. But these two adequacy-relationships, i.e. the thought being at once about itself and not about itself, can coexist as long as they relate to different foundations. There is *no more incompatibility* here than in the analogous coexistence of exact likeness and unlikeness (as obtained in the case of colours) (p. 14; my italics).

Meinong realises that this sort of strategy is hardly going to succeed with every paradox.

> ...there are (peculiar) circumstances which might prevent us from allowing this kind of tolerance, and which would make the charge of "meaninglessness" [Mally's charge] plausible and significant (p. 14).

Consider 'what I apprehend is false' where my thought points to nothing beyond this falsity.

> In the case of such an incomplete expression, as in the analogous incomplete expression 'What I apprehend is correct' one is confronted with a peculiar defectiveness in the object of thought, which always becomes evident when an apprehending experience tries to refer to itself as immediate object (p. 15).

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[1] It is only fair to say that the simple technical apparatus on which a coherent paraconsistent approach is based was not available in Meinong's time.

Note that all page references in this section without further citation are to EP.

The defectiveness lies in a failure of reference and, more generally, of a reference chain, to have an ultimate ground, to closed reference loops. Just as 'no relations can be based exclusively on relations as inferiora', reference chains 'must have an end and that end must consist in an object that is not itself an apprehension'. Defective objects violate this requirement: they are defectively incomplete objects, to which Mally's expression 'meaningless' may appropriately apply.

> [If] the defective object is itself apprehended ..., then one is confronted with defective objects which lack even Aussersein, though this expression is indeed peculiar. In this case one is not really confronted with an object, and experiences of apprehension in this instance lack a proper object.

With this admission the fabric of Meinong's theory is beginning to break down: defective "objects" are not objects, though the objects of such presentations; and there is no excluding such presentations, since their occurrence is a phenomenological fact, and every presentation must have an object. Nor, as Meinong realises, will it honestly do to say, in every defective case, that the presentation is of something other than what seems to be.

In fact Meinong does not settle the status of defective - or as we may call them paradoxical - objects, and leaves it open that defective objects might somehow be counted as objects. He considers the following objection to the proposal that defective objects are not proper objects and lack Aussersein (p. 20):

> If Aussersein cannot be denied to the round square, how can it be denied to defective objects, which in some respects pose fewer difficulties?

Meinong emphasizes that he has found no sufficient grounds to revise his claims concerning impossible objects, despite doubts repeatedly expressed about them; but he also indicates that he could be prepared to revise what he has said about defective objects.

> It would not be surprising if further research in this peculiar, unfamiliar field of objects should produce unexpected results; and it might be a mark in favour of future resolution of present controversies if the objection to the theory of defective objects just set forth should be shown to have something right about it which has erroneously been taken to be an argument against the Aussersein of impossible objects (p. 20).

By way of partial summary:- Meinong discerns a class of defective or paradoxical objects and he also diagnoses the cause of the defectiveness, namely closed reference looping (or in more picturesque terms, failure of namely riders). He is also clearly aware that as a result of contingent circumstances perfectly satisfactory objects (statements) may be rendered defective, e.g. of thoughts, wishes, and so on, which are not normally paradoxical, which become paradoxical owing to contingent circumstances (cf. Prior's family of paradoxes in 61). He tentatively excludes these paradoxical objects from the theory of objects proper; in particular they are not open to quantification (p.19), and they are absurd. But he also leaves the way open for an alternative treatment; and certainly a paraconsistent treatment could be adopted which would save his theory from breaking down at critical points. However Meinong appears completely unaware that the paradoxes might be handled in a para-consistent fashion, and rules such an approach out in the case of the Russell paradox.

My conclusion, then, also tentative, is that Meinong saw his theory of impossible objects as part of a consistent framework, a framework that would be shattered by the full admission of paradoxical objects. If this is right the paraconsistent Meinong is not the historical Meinong: Meinong intended his position to be a consistent one. But though he aimed for a consistent theory, he did little to show that he had arrived at such a theory. Thus Findlay's assertion (63, p. 327) that Meinong certainly showed us how to talk consistently about objects including numbers, classes and propositions, is a vast overstatement. There is certainly no demonstration, nor even a discussion of the question of demonstration, to be found in Meinong. And of course, for all our techno-logical advances, we remain pitifully supplied with demonstrations of consistency, even for formalised parts of the theory of objects such as bits and pieces of mathematics.

Was Meinong consistent, in accord with his intentions? It is difficult to be sure. But it seems that he probably failed, restrictions on the CP not being tightly enough secured. However, the theory cannot be simply dismissed because of this, especially as relatively simple modifications would appear to render important parts consistent. Moreover most productive philosophers are probably not consistent. At most only parts of their theories can be dismissed on that basis.

The exciting idea, fashionable in Brazilian logical circles, of reconstructing (the central part of) Meinong's theory of objects within a paraconsistent framework, is then unhistorical. Even so, the paraconsistent approach has much to recommend it, and it appears to be a more promising way of elaborating the theory of objects than the consistent route Meinong tried to follow.

§4. *The paraconsistent position, and forms of the Characterisation Postulate in the case of abstract objects.* The questions at the end of §2 take us directly to the paraconsistent Meinong. Before waving goodbye to the consistent Meinong, it is worth taking stock of some of the very real advantages that are lost by going paraconsistent. A major disadvantage of the loss of consistency is that analogues of the classical theory and arguments cannot be simply taken over, appropriately reinterpreted and enlarged, e.g. by predicate negation. As explained in detail in RLR, classical logic fails outside consistent situations; specificially Disjunctive Syllogism and the corresponding rule of Material Detachment, i.e. (γ) $A, \sim A \vee B \rightarrow B$, both fail.

In short, paraconsistent interpretations of Meinong exclude the general use of classical logic (reinterpreted as in chapter 1 and elsewhere), though classical logic can be used in a restricted class of cases, e.g. those where consistency can be proved or, more likely, is assumed. Going paraconsistent requires then some far-reaching logical changes (of the sort already outlined elsewhere, e.g. UL), whose ultimate foundational satisfactoriness remains, at this stage, a somewhat unknown quantity and in too large a measure a matter of conjecture. Firstly, it is not known whether various paraconsistent theories of interest, such as paraconsistent set theories of modest strength, are nontrivial.[1] Secondly, it is not known how much such paraconsistent theories are good for, e.g. how much of classical mathematics can be recovered within them (without further, and unguaranteed, assumptions[1]). Classically, one would expect a trade-off like that between consistency and completeness, only now between nontriviality and adequacy; but the classical arguments for such an exclusion depend really on the paradoxes and cease to apply outside a classical framework (cf. UL).

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[1] Postscript: But see now point 1, p.892.

These uncertainties do not, however, have much bearing on the philosophical adequacy of paraconsistent theories, unless, for example, it is erroneously taken that classical mathematics as a whole is some sort of revealed gospel which stands without any addition in the way of consistency assumptions. But the philosophical adequacy of paraconsistent positions is certainly in question on other grounds, not least the amount of damage it does to traditionally accepted modes of argument, such as the rejection of inconsistent theories without further ado. Such modes of argument are not as generally applicable as has been supposed (cf. Routley 79). But before taking up these issues it is worth asking whether going paraconsistent, or more accurately going dialectical, helps solve the problem of determining the scope of validity of the Characterisation Postulation, and whether, in particular, restriction on the principle can be removed in a paraconsistent setting.

The paraconsistent shift certainly removes the anomaly in the negation case, between the round non-round and the round which is not (sententially) round, and it enables a more uniform and appealing treatment of paradoxical items. However the CP does not emerge unscathed in an unqualified form - nor would one expect it to - even in paraconsistent theories, unless the theories are not closed under Modus Ponens or are trivial (and so not really paraconsistent). For consider, e.g., the statement r_0 which is true and entails every statement (or entails the false). By an unrestricted CP, r_0 is true and entails every statement, hence, using just the Modus Ponens rule (for entailment), the theory is trivial, since every statement is true. That is, the Characteristation Postulate yields, without an intermediate argument through logical principles such as Contraction (of antecedents), versions of the Curry-Moh-Shaw-Kwei paradoxes. Thus the Characteristation Postulate is a more powerful principle than the various abstraction principles which it implies,[2] since in weak logics the latter principles do not trivialise.

The reasons for failure of unrestricted forms of the CP are obvious enough. Whether a statement is true, like whether an object exists, is not really up to it, but a matter of external circumstances, of factual matters beyond its control. A statement can no more determine its own logical status directly, e.g. by announcing its own truth or what it entails, than an object can directly determine its own ontological status and its own circumstances, whether it exists, and to what actual things it relates. These evident features show how characterisation postulates, and more generally postulation, should be controlled.

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[1] The notion of recovery is not uniquely determined. There are trivial ways in which what is called classical mathemtatics may be "recovered", e.g. by simply adding enough assumptions, or by invoking limited consistency assumptions, presupposed classically anyway.

[2] It may be that abstraction principles yield all the information that is required concerning objects of higher order, and that the CP vanishes into such principles at the higher order. This proposal is followed up shortly.

It is not just with objects of higher order that an uncontrolled CP causes havoc, at worst triviality. Consider to illustrate a method which applies to both individuals and numbers, the number which is identical with 7 and which multiplied by 2 gives 16; then for this number n_1, $n_1 = 7$ and $n_1 = 8$, so $7 = 8$ by transitivity. By iteration of the method, there is only one number, and one thing - a simple proof of monism. But there are also many things and infinitely many numbers, so monism is combined in an inconsistent union with pluralism.

A shift to paraconsistency does not give then complete absolution to an uncontrolled CP, though it renders determination of the forms of the CP *much* easier, especially in the case of higher order objects, and the results *more* satisfying in bottom order cases (by removing "anomalies" such as the exclusion of sentence negation in CPs). The question, even for the paraconsistent Meinongian, is: what are the bounds on postulation? More narrowly, what are the correct forms of the CP? Enter the Idiosyncratic Platitude of commonsense philosophy (cf. chapter 6): every sort of item has its own sort of logic. In the case of entities, a definitive form of the CP has already been investigated (in 1.21). In the case of important objects of higher order the question is not as difficult to answer (within limits) as might be expected. Consider, for example, sets: the cases for properties and relations are similar, and those for propositions and propositional functions have much in common.

What is the set of elements which are A, i.e. $\{x : A(x)\}$? First, it is an object. This is especially obvious in the Meinongian case, since it is an object of thought, of predication, and so on. Furthermore there is little difficulty in saying which object it is. It is the object comprising exactly those objects which are A. Cashing *comprising* in terms of membership and *exactly* in terms of a biconditional, $\{x : A(x)\} = \iota w(y)(y \in w \leftrightarrow A(y))$. Note further that this set $\{x : A(x)\}$ is an object specified in the form $\iota wB(w)$, i.e. $\{x : A(x)\} = \iota wB(w)$. Hence, applying the CP, $B(\iota wB(w))$; i.e. $(y)(y \in \{x : A(x)\} \leftrightarrow A(y))$, whence particularising $(Pz)(y)(y \in z \leftrightarrow A(y))$, i.e. the familiar comprehension principle follows.[1]

This sole application of the CP, which can be independently argued for, yields practically all, perhaps all, of the features of sets. Accordingly it is tempting to suppose that the CP can be replaced entirely in the case of sets by one of its proper consequences, an independently defensible principle which gives the correct conditions on the CP for sets.

This is, in effect, just the restriction that *was* assumed classically. For the classical CP delivers a classical (naive) abstraction axiom, and the classical abstraction axiom yields in return the classical CP for sets. The classical connections are these:

$E!\,(\iota xB(x)) \equiv B(\iota xB(x))$

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[1] The argument is correct classically on the hypothesis that $E(\{x : A(x)\})$ i.e. that the class $\{x : A(x)\}$ exists (uniqueness being guaranteed by extensionality).

Strictly z is subject to conditions required for correct particularisation, viz. z is not free in A(y).

$\{x : A(x)\} = \iota x(\forall y)(y \in x \equiv A(y))$, i.e. $\iota x B(x)$ for short.

Hence,

$$E!\,\{x : A(x)\} \equiv (\forall y)(y \in \{x : A(x)\} \equiv A(y)).$$

Thus, given the abstraction principle, $E!\,\{x : A(x)\}$, i.e. $E!\,(\iota x B(x))$, whence the CP, $B(\iota x B(x))$ follows; and given the CP, set existence follows, whence the abstraction axiom results as before.

For abstract objects of other varieties a similar replacement of the CP by independently defensible abstraction principles appears equally promising: the independent defence is just that sometimes given for "naive" abstraction principles. For example, the relational CP is simply $(Py)(x_1 \ldots x_n)((x_1 \ldots x_n)\; i\; y \leftrightarrow A)$, subject perhaps to the provision that y is not free in wff A. Where $n = 1$ the property CP results, where $n = 0$ the propositional CP. All this suggests that in the case of abstract objects, characterisation postulates may be replaced by abstraction postulates, i.e. abstraction characterises abstract objects. Once classical existence and possibility assumptions are got rid of this suggestion appears to have much merit.[1]

§5. *The bottom order Characterisation Postulate again, and triviality arguments.* It remains to control the CP in the case of particulars or objects of bottom order where, because the objects are not abstract, no abstraction principles are available to undertake the talk. The general principle restricting postulational methods in general and the CP in particular we have already observed: one can only successfully determine what is open to determination, and very much is not open to determination so one is not free to determine it by postulation, e.g. whether Capetown is north of Tangiers, who was the father of John Stuart Mill, whether the aether exists, how old Ivan Illich is, whether Peano arithmetic is consistent. In particular, then, an item cannot determine through its own characterisation, by describing itself appropriately, matters that are otherwise determined, it cannot settle its own ontological or modal status or its relations to actual things where these relations induce new relations between actual things. What goes wrong if the CP can determine matters that are not open to determination, in a way incompatible with how things actually are we can see by examining a variant of Parson's "version of Meinongian ontology" (in 74 and 75),[2] call it the naive variant. Parsons' 1974 theory is based on the following principle (75, p.75):

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[1] Of course classical connections such as $A(\iota x B(x)) \supset B(\iota x B(x))$ have to be rejected too.

Whether the entire postulational method for higher order objects of mathematics can be reduced to abstraction axioms or, more generally to characterisation postulates (classically then to existence assumptions), it is unnecessary to settle. This is a technical issue as to a general class of reductions (assuming of course that choice principles and the like can be accommodated in some suitable way). The success hitherto of reductions, e.g. in reducing numbers (which are still at first-order stage characterised through induction), analysis etc., does not guarantee future success with respect to objects introduced by esoteric postulation procedures - unless postulation procedures can themselves, as has sometimes been supposed, be exhaustively catalogued.

[2] (Footnote on next page.)

> PP. For every object x and every nuclear property ρ, x has ρ iff ρ belongs to the set correlated with x.

The principle is

> true in the case of real objects, because this just was the defining condition for what the correlation was in that case. It's to be true in all other cases as well - by edict (p.75).

As before, determining which predicates are nuclear (Parsons' version of characterising) and which are extranuclear is obviously crucial to the enterprise. For consider the set of properties {goldenness, mountainhood, existence}. If existence were nuclear then the object correlated with this set, the existent golden mountain, would exist, contradicting the facts. 'Exists' is accordingly extranuclear. Among nuclear predicates, which he variously describes as ordinary predicates and as predicates which stand for properties of individuals, Parsons lists these (p.76) 'is blue', 'is tall', 'kicked Socrates', 'was kicked by Socrates', 'kicked somebody'.[1] Extranuclear predicates include ontological and modal predicates, intensional predicates, and logical ones such as 'is complete' and 'is determinate'. Indeed the division is very similar to (but not the same as) that (of 1.21) for ch and non-ch predicates. The reasons for the similarity are (we should like to think) that the division reflects a natural classification. But it is also true, as Parsons likewise observes, that development of a theory of objects of a Meinongian cast tends to force such a classification, as well as clarifying and sharpening it.

The following more problematic sorts of predicates are nuclear as well under the accounts Parsons gives: 'is taller than Socrates', 'is father of Socrates', 'lived off Baker Street'. But with this admission (necessary for an adequate theory, so it was argued in 1.21) the naive Parsons theory is inconsistent with the facts.[2] For consider objects like the following:-

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[2] (Footnote from previous page.)

The term 'ontology' is Parsons': although such uses of the term have wide currency, especially in North America, they are decidedly misleading, something I believe Meinong would have thought also. Such uses typically presuppose the Ontological Assumption.

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[1] Parsons is not specific about the sort of quantifier, especially whether its range is restricted to entities. If not, then ancient puzzles can arise, such as what happens when the irresistable force meets the immovable body, or when the universal solvent is applied to the insoluble element.

[2] Inconsistency, and even total theoretical destruction, is the fallout from going excessively nuclear. The naive Parson's theory is not alone in suffering such a fate. Castañeda's presentation in 74 of a "Meinongian" theory appears (the theory is not sharply enough articulated to make this completely certain) to encounter a similar disaster (see 12.4).

(1) the Greek who is taller than Aristotle and shorter than Socrates,

(2) the man who is father of St. Thomas Aquinas and son of Bertrand Russell, i.e. the object correlated with the set {human, the property of being father of St. Thomas Aquinas, the property of being son of Bertrand Russell}.

Then by PP and (1), the Greek in question is taller than Aristotle and shorter than Socrates, whence, by the logic of relations, Aristotle is shorter than Socrates, which is false. Similarly from (2) and PP - upon defining grandfather so that, if for some x, x is son of y and x is father of z then y is grandfather of z - Bertrand Russell is grandfather of St. Thomas Aquinas!

Two possible ways out of this trouble - neither so easy if one is attracted by the splendid simplicity of Parsons' original theory, before, that is, one sights the theory of relations - are to redefine nuclear or to amend PP. Neither course is satisfactory. PP is a consequence of the Characterisation Postulate HCP, already argued for, by principles of the logic upon letting χ be the set correlated with x and taking A(f) as $f \in \chi$ and allowing HCP to generate every object. To abandon PP would be to leave the theory without a Characterisation Postulate and so any way of effecting, what is essential, the assignment of extensional features to nonentities (as to the reasons for this and its importance see the transcendental argument of 6.4). However modific--tions to PP are not thereby excluded and are feasible. One such, designed to ensure that nonentities accord with familiar deductive practice and so are closed under consequence, is as follows: for every object and every nuclear ρ, x has ρ iff ρ is entailed by properties in the set correlated with x. But firstly this is but a special case of PP, obtained by taking the properties in the set correlated with x to be closed under entailment; and secondly it is not appropriately general, since many nonentities (e.g. those of visions and dreams) are not so closed under deducibility. The same will be found of other seeming more plausible modifications. The full strength of PP at least is wanted if the rich variety of nonentities of theory and thought, imagination and experience, are to be included in the theory.

A repair by excluding relational predicates from among nuclear predicates has already been excluded as a live option. Such a course would have the very damaging effect of preventing nonentities from entering into relations of a range of sorts. Yet many nonentities certainly stand in relations. Fictional items can be grandfathers, taller than others, live in various cities, etc. But though relational predicates cannot be ruled out (without so weakening the theory that it cannot account for the data), there is an intermediate course: namely to exclude from the class of nuclear (relational) predicates those which state relations to entities. This is not so restrictive as may at first appear, since duplicates of entities can be used, e.g. in place of 'lived in London', 'lived in Dickens' London', and similarly 'Shakespeare's England', 'that England', 'merry England'. Duplicates may be used because they do not interfere with what is independently, and perhaps differently, determined, e.g. by force of historical circumstance. Such duplicates are characterised, and criticised, in chapter 7: the theory is nothing if not generous with respect to the range of objects it allows, as it should be in accord with its charter (p.2 ff.).

While there is nothing theoretically amiss with duplicate objects, and indeed (unlike say sense data) there is a place for them, they are not adequate to the data to be theoretically reflected, either in fiction and cognate topics, or as regards isolated and homeless "philosophical" objects.

For example, the difference between the queen of France and the queen of England lies in the relations of the queens respectively to France and England, not to duplicates or to a duplicate in one case but not in the other (irrespective of the problem of defining duplicates in such cases, where source books tend almost to vanishing point). Likewise the tension of the queen of France's features with the historical circumstances, that France has no queen, is precisely due to the relation to France, not to a tension-removing duplicate. And so on (see 7.7).[1]

Given that relational predicates are in, as nuclear, the viable course for a consistent theory of objects (that adopted both in Parsons' far from naive theory 74 and in 1.21) is to *modify*

(i) the classical theory of relations,[2] and

(ii) the classical theory of definition.

It is pleasing to discover that these modifications involve absolutely no work, at least formally. For the classical theories are always imposed on top of the underlying logic. The theory of definition, where presented, is a separate section in the *meta*logic, while the theory of relations requires many additional axioms that are not part of the basic theory. None of these additional schemes are part, for instance, of quantification theory, e.g. it is not a thesis, but an additional postulate, that *taller than* is transitive, and that *taller than* contradicts *shorter than*.

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[1] Since the logic of relations can be rendered much more (classical and) familiar by weakening to duplicates, the weakened alternative theory thereby indicated, with characterising relational predicates restricted to those with suitable duplicate terms, is no doubt worth considering. But there are grounds for suspecting that such a theory incurs serious new problems e.g. as to the interrelations of more and more defective duplicates with their originals. A fine taste of how things might go is afforded by D. Lewis' counterpart theory, since counterparts resemble platonised duplicates.

Ruling out relations to entities from among characterising properties would remove part of the case for excluding intensional properties from among characterising or nuclear properties; e.g. difficulties with the objects out the window seen by you that you did not see (since they would only be seen by your duplicate, or *one* of them). Does it remove the case entirely? There are other reasons for thinking it does not. One is that characterisation aims to give something like the nature of the object characterised and it is commonly assumed that nothing, not even non-entities, can be intensionally characterised. That isn't really so obvious. Another reason is this: just as a set is a certain object, so an individual a is a certain object, namely the a-ish object, or in modified Russellian, $a = \iota x(x = a)$. Now the requisite criterion for identity is coincidence of extensional features. Accordingly it would seem (but the argument can be defeated) that a is characterised by none but extensional features, a conclusion already independently reached.

[2] Similarly Chisholm 72, p.36. In a way the *basic strategy* for a theory of objects is to break vulnerable classical connections derived from the logic of entities, e.g. such imposed relations as $a{\sim}\text{round} \rightarrow {\sim}a\ \text{round}$. In like manner the theories of Castañeda 74 and Rapoport 78 break classical predication assumptions (but wrongly: see 12.4).

A neutral theory of relations - to give the rival an appropriate name - simply does not accept all the classically-imposed relations and conditions.[1] It would be quite fallacious to conclude however that it accepts none. What the neutral theory does is to impose duly qualified forms of the classical axioms; e.g., certainly (significance aside) $(\forall x)(\forall y)(x < y \,\&\, y < z \rightarrow. \; x < z)$ where < represents 'is less than', and certainly such a restriction to entities though sufficient is not necessary, since similar transitivity holds, for instance, for all ordinal numbers. But it does not hold even for all numbers, as examples like (1) restated with numbers show. Consider

(1') the object [number] less than 5 and than which 7 is less.

Then $n_c < 5$ and $7 < n_c$, for that inconsistent number n_c, whence by transitivity for all numbers $7 < 5$. That does not however impugn transitivity for all natural numbers or for other well-behaved nonentities. Thus the neutral theory of relations does not, as a null theory of relations for nonentities would, cripple what Meinong saw to be among the most important applications of the theory of objects, those in accounting for mathematics and significant parts of the theoretical sciences, in treating mathematics as a daseinfrei science. For mathematics is substantially based (as PM has demonstrated) on the logic of relations.

§6. *Characterising predicates and elementary and atomic propositional functions, and the arguments for consistency and nontriviality of theory.* As repeatedly seen, nonentities do not have, by any means, all extensional features their descriptions or (more generally) source books present them as having. Nonentities cannot settle their own ontological status, their own identity, nor can they be their mere sayso impose relations and conditions on actual things and places. But a great many features remain that they do have, (s-features and) features that are reliably presented, characterising features.

It is enough to begin with, and for a distinctive logical theory of nonentities, to indicate with some precision two moderately comprehensive classes of predicates, first those that definitely are characterising, and second those that definitely are not. It does not matter, for the time being at least, if the classification is not exhaustive, if questions are left open for further, later, determination (cf. deductive theories which are commonly incomplete in this sort of way; and recall intuitionistic mathematics on further determination). It would aid the noneist cause, by helping to reduce the charge of arbitrariness in the division of predicates adopted (that of 1.21) if the division can be found in, and has a solid-looking basis in, classical orthodoxy, and fortunately this is the case. The first two primitive ideas in Principia Mathematica *1, are those of elementary proposition and elementary propositional function; and these will serve. The primitive notions are explained - in none too sharp a fashion - as follows:

> By an 'elementary proposition' we mean one which does not involve any variables or, in other language, one which does not involve such words as 'all', 'some', 'the' or equivalents for such words. A proposition such as 'this is red', where 'this' is something given in sensation will be elementary. Any combination of given elementary propositions by means of negation, disjunction or conjunction will be elementary.[2]

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[1] The conditions modified include extensionality conditions: see 7.7 II.

[2] (Footnote on next page.)

A "consistent" noneist would of course modify the final recursion clause, ruling out negation and disjunction, and perhaps conjunction also, but in a paraconsistent theory such qualifications are unnecessary, and undesirable. Elementary predicates are determined in terms of elementary sentences in the expected way (PM, p.92):

> By an 'elementary propositional function' we shall mean an expression containing an undetermined constituent, i.e. a variable, or several such constituents, and such that, when the undetermined constituent or constituents are determined, i.e. when values are assigned to the variable or variables, the resulting value of the expression in question is an elementary proposition.

Examples Whitehead and Russell give of propositions which are not elementary are (PM, p.93): 'Every individual is identical with itself' and 'There are individuals'. Other examples of sentences which are not elementary in the sense given are 'This is a universal solvent' (an example due to M. Tooley), 'This is self-identical' and 'This exists', all being excluded because they involve implicitly quantification. Whitehead and Russell would have excluded sentences involving the predicates 'identical' and 'exists' on precisely the same grounds. Identity is explicitly defined in quantificational terms (*13). Consider 'exists', E! in the notation of PM. According to PM (pp.174-5), E!z is only significant (and well-defined) where z is a description. Hence judgments of the form E!z involve implicit quantification (which elimination of descriptions explicitly shows), and so are not elementary.[1]

Certainly too Whitehead and Russell would have accounted intensional predicates nonelementary, since in PM extensionality is always a matter of functions of propositional functions, and so in one obvious respect - though it does not conform to the letter of the characterisation given - is non-elementary. To obtain the requisite definition of 'elementary' which does exclude intensional predicates (as seen by Whitehead and Russell) it is enough to turn to the second edition of PM (PM2). There (PM2, pp.xv-xvii) elementary propositions are all truth-functional compounds of atomic propositions, where

> atomic propositions may be defined negatively as propositions that contain no parts that are propositions, and not containing the notions "all" or "some". Thus "this is red", "this is earlier than that", are atomic propositions.

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[2] (Footnote from previous page.)

Elsewhere Russell says, more succinctly, 'A proposition containing no apparent variables we will call an elementary proposition'; it can be safely assumed that the variable binding test applies to wff in primitive form.

Because Parsons' nuclear predicates may include quantified terms, as does 'kicked somebody' (75, p.76), nuclear predicates do not coincide with elementary (or atomic) propositional functions, or (so it will now be made plain) with characterising predicates. The classes also differ in other ways as regards relational predicates (see again 1.21).

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[1] Elementary wff of second-order logic 2Q were precisely defined on p.226 above.

Atomic propositional functions accordingly provide pretty much the class of characterising predicates (for putatively consistent noneism). Where the match is not perfect it can be made so by but trifling adjustment.

For the arguments which follow however a perfect match is not required and the predicates concerned may be a rather more sweeping class. Let us call them, in keeping with the popular particle analogies, *fundamental* predicates. It is intended that all characterising predicates are fundamental, and where precision is required fundamental predicates can be defined as the smallest extension of atomic predicates that includes ch predicates and ipso facto ch-forming operations thereon (i.e. fundamental predicates result from the closure of atomic predicates under ch-forming operations, such as predicate negation, the s operation, etc.). Thus the predicate negates of atomic predicates are fundamental; and in the paraconsistent theory the sentence negates are also, i.e. in paraconsistent theory all elementary predicates are fundamental. Naturally fundamental predicates will conform to logical postulates, e.g. to the postulates of the carrier logic and predicate negation. What is important for nontriviality is that fundamental predicates have *no special constraints* imposed upon them, that is they satisfy no further conditions beyond these, such as axiom schemes interrelating them or definitional conditions. In particular then, neither the theory of relations nor the theory of definitions places any constraints on these predicates. As usual in nontriviality arguments definitional issues can be removed by working always with primitive notation.[1] The damaging effect the theory of relations could have is evident enough: if, for instance, it yielded connections of the form $(x)(xf \supset {\sim}xg)$ for f and g fundamental (e.g. x is taller than Tom materially implies that it is not the case that x is shorter than Tom), then f and g would not be jointly satisfiable in any consistent theory, and contradiction would result from application of FCP to $\xi x(xf \;\&\; xg)$.

The nontriviality problem for *first* and *second-order* theories of items is approached by stages. The carrier logics are consistent, as may be shown by either semantical or syntactical arguments, e.g. by a finite domain modelling of modalised type theories (as of the logics of Bressan 72 and of S5-modalisation of the type theories of Church 40 and Henkin 50). Such modellings show that the logics are consistent, and the modellings can be syntactically presented as finitary consistency proofs (as in Church 56 for second-order logic). The same applies to relevant type theories, since they can be viewed as subtheories of modalised type theories. Also shown consistent in the same standard fashion are theories with many of the additions of $\Box$2Q+ (and its relevantisation), e.g. abstraction schemes, λ-conversions, predicate identity, additional predicates, etc. There are in fact only two serious sources for doubt at the second-order, namely Characterisation Postulates for bottom order objects, and adding to this, s-predicates and their logical conditions. The issues are treated in stages. The stages consist in considering step by step additions of CPs for bottom order objects to first-order and then second-order logics. The point of such a treatment is to reveal some of the different methods that are available, and also because the treatment is not fully worked out or definitive.

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[1] Thus identity determinates are replaced in second-order logic $\Box$2Q+ through their defining clauses. No postulational conditions remain, *except* those on the predicate ext, which is noncharacterising, being logical.

FCP and a "first-order" stage:- The stage is first-order in a liberal sense, that it admits such logical apparatus as ξ used in formulating FCP, as follows in the paraconsistent case:

> FCP. $A(\tau x A(x))$ where $A(x)$ is an elementary predicate containing just x free and τ is an appropriate descriptor, e.g. 'an arbitrary', 'the'.

This form of the Characterisation Postulate, which is not far removed from Meinong's eventual form, has the substantial advantage that a straightforward proof of its nontriviality can be given within a paraconsistent neutral quantification logic, thereby putting an end to a considerable class of doubts as to the coherence of any such alternative commonsense logic (many other doubts remain, needless to say, to keep noneists in business for many years). Consider the logic LQCP obtained by adding FCP, with specific descriptor ξ, to the logic LQ of relevant quantified entailment with neutral quantifiers, with the elementary predicates in FCP consisting of atomic one-place predicates of LQ and appropriate (same variable) truth functional compounds thereof: LQ may be any one of a range of quantified relevant logics (see 1.23). Thus LQCP has as well as the connectives $\&$, $\vee$, $\sim$, $\rightarrow$ and neutral quantifiers U and P of LQ, the term-forming descriptor ξ, one-place elementary (i.e. atomic) predicates, and also some sentential parameters. A key feature of the semantics of LQ (as given in 1.23) is that for any zero-degree (or classical) wff there are situations where it holds and situations where it fails. This sort of feature can be exploited in showing that LQCP is nontrivial. The argument conveniently takes a semantical form, though, like the argument for the consistency of quantification logic which it resembles, it could no doubt be rewritten syntactically: note that, like the semantical consistency argument, only soundness of the semantics is required. Interpret LQCP over a domain $D = \{\text{the round square}\}$ consisting of one object d (= the round square). Assign every atomic one-place predicate so that it holds of d at T and does not hold of d at $T^* \neq T$, e.g. for f atomic and t a term, $I(f(t), T) = 1$ iff $I(t) \in I(f, T)$, i.e. by the specification, iff $d \in \{d\}$; and $I(f(t), T^*)$ iff $I(t) \in I(f, T^*)$, i.e. iff $d \notin \{d\}$. Interpret $\xi x A$ as d, i.e. $I(\xi x A) = d$ always. And finally for some sentential parameter r (understood as, say, "The theory of objects is not true"), assign r not true, i.e. r fails at T, i.e. $I(r, T) \neq 1$, i.e. the theory of objects is true. Then, by induction, every elementary predicate wff holds at T, i.e. is true, so FCP is true. But r is not true, so the theory is not trivial.

An analogous argument using strict-implication in place of relevant implication, will show that a version of FCP in which negation does not occur can be added consistently. That is, a (weakly admissible) positive characterisation postulate does not render neutral logic inconsistent. The arguments can also be extended to accommodate predicate negation (construed as a "positive" operation). Similar arguments also extend to second-order, and they can be used to show the relative, nontriviality (or positively restricted, the consistency) of stronger forms of FCP than that adopted, in particular the predicative form of FCP (which admits "first-order" quantification as well as sentential operations).

Although the logics of nonentities for which nontriviality arguments have been sketched can hardly be criticised from a comparable classical perspective as too weak, the logics are too weak for various expected and intended purposes; in particular FCP, in whatever form, does not fulfil the important negative role of excluding features from characterisations of nonentities. To obtain a more balanced logic of nonentities, it is necessary to strengthen FCP, as in 1.21, to HCP.

The HCP stage in an enlarged second-order setting:- The setting is 2Q+ [or a relevant analogue] with all the additions that were made in advance of characterisation postulates - so excluding both HCP and further classes of characterising predicates, such as s-predicates, hyphenation and the like. Consistency [or nontriviality] of the background logic (symbolised BL) is established as before by rather standard methods, so the main question at this stage is whether consistency can be extended to include HCP. The procedure of method 1 is to (try to) show that in certain models among those for BL, HCP holds.

To satisfy HCP it is enough to satisfy the principle

HCP'. for every set χ of ch predicates, there is some x for which $xf \equiv f \in \chi$.

For A(f) of HCP determines a set $\chi' = \{f : A(f)\}$ of predicates and will be satisfied if this substitute is; and HCP only looks at characterising predicates in χ', so χ' can be restricted to χ. Now it is rather easy to find models of extended second-order (and higher-order) logics which satisfy at least one half of HCP'. For

FS. Every set of fundamental (one-place) predicates is simultaneously satisfiable wrt some model.

FS can be trivially guaranteed by equating every fundamental predicate with some one atomic predicate (taking predicate negation as an identity operation, etc.). Less trivially, the methods of a Skolem-Lowenheim argument can be applied (cf. Church 56, exercise 54.5, p.317). FS is like the result of the first stage, and depends similarly upon the lack of special constraints on atomic predicates (hence the importance of excluding logical predicates such as = and $\in$ from among them). Principle FS yields only one half of

HCF', that for some x, where $f \in \chi$, xf.

To ensure the converse negative half as well FS is strengthened to

SFS. For some model, for any set χ of fundamental predicates, there is an item which satisfies just the predicates in χ.

The argument involves doubling-up on the elements of the domain of the model M' for FS. Let χ be any set of fundamental predicates. Suppose in M', applying FS, z' satisfies every element in χ. Let z, the double of z', satisfy just those predicates z' satisfies that are in χ. That this specification is in order, and a model results, derives again from the absence of constraints on fundamental predicates.

To establish the consistency of an extended second-order logic which includes HCP, select a model for which SFS holds. In short, proof of SFS for a BL model suffices to establish the consistency of BL + HCP.

There are ways of modelling HCP in second-order theories which appear to yield more information and which deliver syntactical proofs of consistency (though presumably the argument outlined can be recast syntactically). As we have seen, in order to model HCP in a given logical framework it is enough to ensure that any set of characterising properties exactly determines an object which has them. One obvious way to guarantee such a condition is simply to represent objects as sets of such properties. This is the genesis of method 2 and of Parsons models for theories of objects.[1] Models of this type admit a reductionistic strategy, which explains their popularity. For the properties can (it has seemed) be taken as those that existing objects have, i.e. as properties of entities. Then of course nonentities can be "reduced to" entities; they "amount to" sets of properties of entities. One glaring defect, however, of such reduction proposals is that nonentities may well have properties that no entity ever has; other glaring defects are considered later (in chapters 8 and 12). A Parsons model presupposes no such reduction; though it is sometimes technically advantageous to restrict the properties considered to those of entities (e.g. in modelling s-predicate theory), such a restriction is mostly not imposed in what follows.

The charm of method 2 is readily seen if HCP is reexpressed using restricted characterising variable $\underline{f}$, thus:

HCP^r. $(Px)(\underline{f})(x\underline{f} \equiv B(\underline{f}))$, where x is not free in $B(\underline{f})$ and $B(\underline{f})$ (i.e. $A^r(\underline{f})$) is the restricted rewrite of A.

Now when an object is represented as a set of properties - so x translates to χ - an object's having a characterising property is represented as the properties belonging to the set - so $x\underline{f}$ translates to $\underline{f} \in \chi$. Thus HCP^r translates to

HCP^t. $(P\chi)(\underline{f})(\underline{f} \in \chi \equiv B^t(\underline{f}))$, with χ not free in $B^t(\underline{f})$;

that is HCP^r translates into nothing other than an abstraction scheme, and so is automatically vindicated in a suitable translating logic. Thus if the translation can be extended to the whole of BL + HCP, i.e. BLCP, and suitable logical features (such as logical operations) preserved under translation, consistency of BLCP will follow from that of the translating logic.

There are two features of Parsons modellings that determine the framework for the remainder of the detailed modelling or translation adopted. From the perspective of type theory, which supplies suitable abstraction schemes such as HCP^t, a double type lift is involved: objects are represented as items of order 3 (properties, or sets, of properties), which can be taken to correspond in certain cases, when they exist, to items of order 1, entities. Thus since quantification over objects has to be accounted for, a translating logic of at least fourth-order is required. But so long as it includes the apparatus of fourth-order logic, and ideally of BL, the translating logic, TL, can be any of a variety of sorts. For example, a part of ZF set theory without the axiom of infinity could be used. A very convenient translating logic however is an S5-modalisation of type theory formulated with ξ (e.g. a variation on Henkin's formulation in 50 of Church's simple theory of types); nor is modalisation really required, since $\Box$ can be translated into an identity functor (thus $m(\Box A) = m(A)$ where m is the mapping function). Since such type theories have finitary consistency proofs, TL can be assumed consistent. Secondly, a type inversion occurs, in effect, in ascribing a characterising predicate to an object: for on translation the object is attributed to the predicate, i.e.

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[1] Though the idea of such a representation - or as often, but mistakenly, a reduction - of theories of objects has occurred to several workers, and in principle goes back to Locke (see 12.4), there are two distinctive features of Parsons' use of the representation that justify calling the model a 'Parsons model'; firstly, the (essential) restriction to nuclear features (though this appears also in Mally's theory), and secondly the detailed presentation (in 78) of the resulting models, and application of them in establishing metamathematical results, notably consistency.

$m(xf) = m(f) \in m(x)$, in the set-theoretic modelling,
or $= m(x)(m(f))$, on a pure type (property-theoretic) modelling.

All extensional operators translate into themselves, e.g. $m({\sim}) = {\sim}$, $m(\&) = \&$. Hence $m(A \mathbin{\&} {\sim}A) = m(A) \mathbin{\&} {\sim}m(A)$; thus if BLCP is inconsistent, so is TL. Variables x, y, ... of BLCP translate into predicates of predicates, say X, Y, ... for convenience of representation, i.e. $X = m(x)$, etc. Similarly predicates f, g, ... translate into predicates, say F, G, ... of the former predicates. Accordingly, $(x_1, \ldots, x_n)f$ translates to $F(X_1, \ldots, X_n)$. It is with the translation of chf that inversion occurs: chf translates to $(Y)(F(Y) \equiv Y(f))$. (Strictly it should be rendered: $(PF)(Y)(F(Y) \equiv Y(f))$, but the translation can be chosen so that F correlates with f.)

The background logic BL remains intact under translation, i.e. theorems translate into theorems. To verify HCP after translation it has to be shown that $(PX)(F)((Y)(F(Y) \equiv Y(f)) \supset.\ F(X) \equiv mA(f))$. By an abstraction scheme of TL, for some Z, say Z_1, $Z_1(f) \equiv mA(f)$. Since $(Y)(F(Y) \equiv Y(f)) \supset.\ F(Z_1) \equiv Z_1(f)$, $(F)((Y)(F(Y) \equiv Y(f)) \supset.\ F(Z_1) \equiv mA(f))$, whence the classical result upon particularising on Z_1.

Working out method 2 suggests a simple translation which requires no type lift, method 3. Translate not just all extensional operators, but all primitive variables as themselves in (appropriate) TL, where TL, as before, contains at least the logic of fourth-order type theory. In order to guarantee HCP it is enough to translate chf suitably, for example as $(\alpha)(Py)(yf \equiv \alpha(f))$, where α is a predicate of predicates of TL. Then HCP translates to $(Px)(f).\ (\alpha)(Py)(yf \equiv \alpha(f)) \supset.\ xf \equiv A(f)$, which is derivable, since $(\alpha)(Py)(yf \equiv \alpha(f)) \supset_f.\ y_1f \equiv A(f)$, by wff substitution upon α (the equivalent of abstraction) and particularizing y.

To complete this outline of consistency proofs, it remains to include firstly ECP and secondly, what takes us to the next state, KCP' and s-predicates. ECP is straightforward, provided that TL contains the expected principle $(\xi xA)E \supset.\ (\exists y)A$. For then ECP translates, under method 3, with E translating to itself, to an expression of the form $(\xi xA')E \supset A'(\xi xA')$. This follows however from the following consequence of the ξ axiom scheme: $(\exists y)A \supset A(\xi xA)$. Type theories usually do not contain E(PM is an exception), in which event a simple move, if it can be got away with,[1] is to translate $(\xi xA)E$ to $(\exists y)A'$ where A' translates A. Again ECP is guaranteed under translation by the ξ-scheme.

The KCP and KCP' stage:- In this final stage s-predicates have to be taken care of, so there is not merely the problem of satisfying KCP, for example, but also of meeting the axiomatic conditions on s-predicates. One of the latter conditions makes it easy to show that KCP can be satisfied when HCP is, as it of course it can be; namely, the condition if chf then f ≈ sf. For define sf partially by cases: when chf then f ≈ sf; when ~chf then ... (to be specified). Then KCP may be derived as follows:- Let B abbreviate chf ⊃. xf ≡ A, C chf ⊃. xsf ≡ A, and D ~ch ⊃. xsf ≡ A. By HCP, (Px)(f)B. Since B ⊃. (chf ⊃. xf ≡ A) & (chf ⊃. f ≈ sf), B ⊃. chf ⊃. (xf ≡ A &. f ≈ sf), whence B ⊃ C upon replacement. Hence generalising and distributing quantifiers (Px)(f)C. But C ⊃. C ∨ D and C ∨ D ⊃. xsf ≡ A, so C ⊃. xsf ≡ A. Hence generalising and distributing again, (Px)(f)(xsf ≡ A), i.e. KCP.

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[1] Care has to be taken with respect to other conditions on E. For example, guaranteeing $(x)xE$ - as the equivalence $xE \equiv (U \text{ ext } f)(x{\sim}f \equiv {\sim}xf)$ would, if predicate negation is translated into sentence negation - could have disastrous results, viz. UCP.

Guaranteeing KCP' - that is, (g)($z_0$sg ≡ A(g)) where z_0 = ξx(g)(xg ≡ A(g)), that the object as such which is A is precisely sA - comes down to choosing models appropriately, models for TL and so for the full second-order logic of items. There are two cases to consider according as the condition C, i.e. (g)(xg ≡ A(g)) with x not free in A(g), is satisfied or not.

Case 1. Condition C is not satisfied. Then z_0 can be arbitrarily chosen among the domain. Choose z_0 as an element satisfying (g)(xsg ≡ A(y)). Since KCP holds in the model some elements are such, so the choice is legitimate.

Case 2. C is satisfied. Then (Px)(g)(xg ≡ A(g)), whence (g)(z_0y ≡ A(g)). Hence, as in the derivation of KCP, (g)(chg ⊃. $z_0$sg ≡ A(g)), i.e. HCP holds with respect to z_0. But now (g)($z_0$sg ≡ A(g)) may be derived in exactly the way KCP was. In sum, neutralised type theory supplies specialised models in which all object axioms hold good.

Catering for further axiomatic conditions concerning s-predicates is partly a matter of completing the definition of sf, that is defining sf in case f is not ch, and partly a matter of ensuring that the translating theory satisfies certain conditions, namely that for some g, effectively sf, chg and (x)(xE & ext f ⊃. xg ≡ xsf) for ~chf. It is rather easy to satisfy chsf: simply identify sf (where ~chf) with an arbitrary characterising predicate. Although the axiom xE & ext f ⊃. xsf ≡ xf is more demanding it is easy to satisfy it vacuously, at the same time, by design of models where nothing exists (set ~f distinct from f always). A less trivial way of guaranteeing s axioms, in accord with method 1, is to elaborate the modelling by duplicating predicates (in the Henkin construction), each one-place predicate being duplicated by another elementary predicate. If f is ch, then its duplicate $f^{\#}$ is equated with f itself; while if f is ~ch then $f^{\#}$ is equated with λx(~x~f). The additions cannot disturb consistency; by virtue of the equations any inconsistency would already have occurred before the duplication. Now for f noncharacterising, define sf = $f^{\#}$. Then chsf, since $f^{\#}$ is elementary; and xE & ext f ⊃. xsf ≡ xf, by the definition of existence. Similar procedures can be combined with methods 2 and 3, which admit however interesting alternatives. The alternative approach is to make sure that the translating logic supplies a subtheory of entities over which certain predicates are characterising. This can be straightforwardly achieved under method 2 by restricting bottom objects, individuals, to entities and assuming that their one-place predicates are characterising. Then it is a matter of translating sf so that it is tantamount to a predicate of individuals (namely, to that predicate of individuals that is equivalent to f's translation applying to properties of the same individuals).

Thus far the representation for special principles, HCP and beyond, of the theory of items has been, in effect, a consistency modelling for the consistent theory. The same sorts of procedures can be reapplied, however, to show nontriviality of the paraconsistent theory by replacing translating logic TL by a relevant logic of types. Such a logic is obtained (cf. PLO) from the simple theory of types, e.g. as formulated by Henkin 50, by replacing classical sentential and quantification axioms by those of a suitable relevant logic, and by upgrading main connectives in other axioms (such as $A\xi$) to corresponding relevant connectives.[1] Then most of the argument goes through as before. The working logic of items is nontrivial.[2]

Since every consistent theory admits - if only as regards demonstration by remaining relatively weak - of consistent extension, and likewise every nontrivial theory admits of nontrivial extension, in each case, to accommodate further logical notions, it is evident that fatal objections to the theory of objects which show inconsistency or triviality are not going to be achieved except by importing (referential) assumptions, no matter how natural or plausible they are presented as being, which the theory should not accept. In short, logics of nonentities are here to stay. They are no longer going to be defeated by demonstrations of inconsistency or triviality.

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[1] Only the extensionality axioms cause trouble, and for the most part those are best dropped. HCP is formulated with a relevant biconditional, and corresponds to a similarly formulated abstraction scheme.

[2] However larger nontriviality questions remain outstanding at present, notably those for CPs for higher order objects: see 6.4 II.

CHAPTER 6

THE THEORY OF OBJECTS AS COMMONSENSE

It is beginning to be appreciated that the Meinong of the mainstream philosophical literature is a mythological figure, that Meinong's philosophy has in fact been presented in an unfair fashion (perhaps even by largely sympathetic expositors such as Findlay 63), and that the theory of objects in particular has been either widely misunderstood or else deliberately misrepresented. What has yet not been much appreciated is that Meinong's theory of objects represents an important alternative to standard (Russellian) logical theory.[1] Whereas the entrenched theory is both reductionist and pragmatico-empiricist in spirit,[2] the alternative is nonreductionist, antiverificationist, and commonsense. Since the theory of objects has often - there are important exceptions - been taken to be the very antithesis of commonsense, there is some explaining to be done. The problems are compounded by the fact that it is not at all easy to say what commonsense amounts to, and even more difficult to show that a philosophical theory is a commonsense one.

§1. *Nonreductionism and the Idiosyncratic Platitude.* Philosophical theories may be roughly divided into reductionist and nonreductionist theories. Wisdom put the difference in this way (53, p.51):-

> The Verification Principle is the generalisation of a very large class of metaphysical theories, namely all naturalistic empirical positivistic theories [and also of idealisms and conceptualisms]. While its opposite, which I venture to call the Idiosyncratic Platitude, is a generalisation of all commonsense, realist, transcendental theories. The verification theory is the generalisation of such theories as: A cherry is nothing but sensations and possibilities of more; A mind is nothing but a pattern of behaviour; ... .

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[1] There need be no apology for calling modern, standard, orthodox, "nondeviant", "classical" logic 'Russellian'. The orthodox logic of the textbooks consists essentially of variations and improvements (or sometimes the reverse) on the logical theory devised in large measure by Russell, building on the work of Peano and others, and worked out in collaboration with Whitehead in Principia Mathematica. Certainly there have been important additions by Hilbert, Wittgenstein, Tarski, Gentzen and others but these do not affect the general claim. In these terms influential modern logical theories, such as those of Quine FLP, are but variations on a theme of Russell's. And they share the reductionist empiricist assumptions of Russell's logical theory.

[2] The linkage of classical logic and empiricism is much more rigorous than this suggests. The linkage is through the Reference Theory, which classical logic encapsulates, and of which empiricism is the epistemological correlate given an account of existence which empiricism dictates. The linkage will be elaborated in later chapters.

The difference is strikingly enough exhibited in the difference between the earlier and later Wittgenstein, between the Tractatus, and the Philosophical Investigations (though Wittgenstein never quite shook off under-lying assumptions of his earlier work, such as the Reference Theory[1]).

In a number of respects Wisdom's way of putting the difference is, however, less than satisfactory. Though reductionist positions are very commonly motivated by the Verification Principle in one form or another - those of idealisms and intuitionisms as well as of empiricisms - they need not be. More seriously astray is what Wisdom has to say about the(?) nonreductionist position. It is not the case that nonreductionism is adequately stated by the Idiosyncratic Platitude in the form 'Everything is what it is and not another thing'. It is not the case that non-reductionism admits no analysis or logical representation of discourse - analysis is, as the chemical comparison suggests clearly enough, not always reduction. It is not the case that all interesting and exciting philosophy is reductionist in spirit and also not the case that (correct) non-reductionism is trivial and platitudinous. Illuminating though Wisdom's general philosophy of philosophy in terms of the interplay of paradoxes and platitudes may be, it too is paradoxical in his generous sense of 'paradoxical' - as Wisdom himself may have been happy to agree.

According to the Idiosyncratic Platitude, in a more satisfactory form, also stated by Wisdom, every different sort of item has its own sort of logic, and such different sorts are not in general in need of reduction. Natural language is sufficiently in order as it is: it is not crammed full of "systematically misleading" expressions, it is not in need of complete reform and restructuring beginning with a levels-of-language restructuring and the elimination of descriptions and all ordinary names, and ending, characteristically enough, with the rejection of substantial slabs of familiar discourse as logically incoherent.

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[1] What Wittgenstein did demolish is the substantially stronger thesis, the Meaning-is-Naming Theory, according to which the meaning of every word is the referent it names, in Wittgenstein's terms (53, p.2) on

> this picture of language ...
> Every word has a meaning. The meaning
> is correlated with the word. It is the
> object for which the word stands.

This theory implies the Reference Theory; for that the meaning of every word is its referent implies that meaning is a function of reference. But the converse does not hold. Although some philosophers (Davidson for example) are committed to the Reference Theory, given their assumptions that truth is a function of reference and meaning a function of truth, they are not committed to, and do not maintain, the Meaning-is-Naming Theory (cf. the discussion in 1.3). Furthermore some philosophers (for instance Quine), who accept the Reference Theory in its important truth formulation, explicitly reject the Meaning-is-Naming Theory while looking askance at the whole notion of meaning.

Classical logics, and also many non-classical logics, do however lead in these reductive directions, inevitably in the case of classical logic and its main modifications (see the argument of Part II, chapter 1).[1] As Findlay remarks in his appraisal of Meinong (63, p.324):

> We cannot treat [Meinong], as did Russell, as affronting our 'robust sense of reality', and as requiring to be exorcized by an elaborate Theory of Descriptions and a general method of 'logical constructions'. We all know where this theory and this method ultimately led. It led to the construction of physical things and minds out of infinite classes of sensed and unsensed sensibilia, or rather their dismemberment into the latter ... .

Most of us know that the logic of Principia Mathematica led directly to the philosophy of logical atomism, we know where the extensionalized form of that logic in the Tractatus led, and we are beginning to see where more recent revivals of these ventures such as the logic of Word and Object (i.e. Quine's WO) lead. It is less evident, but becomes clear upon applying or attempting to apply the underlying theories to the analysis of discourse, that such theories lead inevitably in these sorts of directions, to reductionisms such as atomism and away from realism and commonsense. It is commonly supposed that logic, being reductive analysis, is bound to lead in these sorts of directions (cf. Wittgenstein 53, Strawson 52, Blanshard 39, Marcuse 64). This is the upshot however of far too narrow a view of logic, of logic as necessarily being, for example, extensional, contextless, without categorial distinctions, and so on. None of these features are limitations on modern logic, as recent developments in alternative non-classical logic have shown (see especially the argument of Slog, chapter 4). More and more can be handled logically without reductive distortion, even if logics of ordinary discourse are still some way from being satisfactorily articulated.

Meinong's theory of objects yields a logical theory - or rather, as we have started to see, logical theories - of the latter less reductive kind.[2] Meinong's theory is, essentially, a rationalist, nonreductionist, commonsense theory, a beginning on working out the features of intensionality and non-existence, in particular, without reduction. As already noted, it will strike many as pretty extraordinary to claim that Meinong's theory of objects is, at bottom, a commonsense nonreductionist theory, a theory falling under the Idiosyncratic Platitude. For Ryle's account (in [33]) of Meinong as 'the supreme entity-multiplier in the history of philosophy' has been influential, and even in Passmore's sober judgement

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[1] So do reductionist accounts which reflect classical logic, such as Ryle's account (in 71) of systematically misleading expressions. These accounts certainly do not regard things as in order as they are.

[2] Main logical theses of the theory of objects include those set out on pp.2-3. In addition to nonreductionist theories of objects of both consistent and paraconsistent varieties, there are reductionist theories of objects such as those of Castañeda 74 and Parsons 74, which partially explicate Meinong's theory while sacrificing however some fundamental theses (see 12.4).

> ... objectivity has been preserved at a considerable cost. The Universe, it would appear, is populated by a variety of entities with the most surprising properties 66, p.186).

These assessments, especially Ryle's, are (as explained) misleading. Meinong did not take his objects to exist, to be elements of the Universe, which is what the assessments suppose. Meinong's theory did not include the surprises for commonsense that these assessments suppose.

Evidence that Meinong's theory, his theory of objects in particular, is strongly nonreductionist is not difficult to locate. Almost every sort of object is assigned, on Meinong's theory, its own sort of logic, and objects are investigated in meticulous phenomenological detail as they are without reduction. But some important examples of nonreduction are enough for present purposes. Firstly, discourse about nonentities is irreducible according to the theory of objects to discourse about entities; and secondly discourse about higher order objects is not reducible to discourse about ground floor objects. This does not imply of course, that isolated sentences cannot be paraphrased out, as e.g. 'Pegasus does not exist' may be rendered, preserving truth[1], as 'it is not the case that there exists an entity identical with Pegasus'. What is claimed is that the whole class of sentences of a given type is not replaceable by a class of another type: thus philosophers' attempts to establish reducibility theses (e.g. Ryle's in 71 to show that talk of universals is replaceable by talk of individuals) by showing that a few sample sentences can be paraphrased, are quite inadequate.

Evidence that the theory of objects is antiverificationist, and liable to damage empiricist assumptions, is likewise not hard to come by. Truths about nonentities are not readily, or at all, verified or tested by experience. However this issue gets smudged once theories are introduced, the hypothetical deductive method applied, and empiricism rendered less falsifiable.

Evidence that Meinong's theory is, at least in its broad initial outline, a commonsense one may be reckoned a little harder to assemble but it can be found, especially if we take a little time off to get clearer as to what a commonsense theory is like. That the theory of objects is nonreductionistic does not show that it is commonsense, it simply indicates that the theory is not excluded as a commonsense one since commonsense is typically antireductionist (partly because reductions tend to run foul of hard data).[2] But a nonreductionist position that defends its claims by appeal to various special ways of knowing, for example, is not a commonsense one.

That the distinctive theses of the theory of objects, which are often taken to show that the theory is far removed from commonsense, do not show anything of the sort has been maintained, e.g. by Findlay (though he offers little in the way of argument for the claim, and later on contradicts it):-

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[1] Though not force, or thus replacement in more highly intensional frames.

[2] At this point we begin to get into all the, considerable, difficulties as to what a commonsense philosophy is, difficulties brought out in Grave 67; for example, Berkeley considered his metaphysics complied with commonsense.

> Meinong's most famous and characteristic doctrine, that of an unbounded realm of objects which are daseinsfrei, indifferent to the antithesis between being and non-being, and his frank espousal of the anti-Parmenidean position that what is not is as much the object of significant reference and valid examination as what is, might seem to prove Meinong's extravagance and unsoundness, his wide exceeding of the bounds of commonsense. The doctrine, however, is eminently arguable at a commonsense level, and was once even justified by Russell on the basis of 'perception' (63, p.x).

Even major problems for a theory of objects - the status of the Characterisation Postulate, the postulate according to which, roughly speaking, objects, whether existent or not, have their characterising features, and the matter of restrictions on the application of the Postulate, the issue which separates consistent and paraconsistent forms of the theory - are problems which arise for nonreductionist philosophical theories that are solidly grounded in commonsense: they arise, so to speak, like other philosophical problems, out of commonsense taken as a theory. The preliminary task this gives rise to, is to try to bring out how it is that, despite the apparently, or allegedly, extravagant features of his position, Meinong is essentially a philosopher of commonsense in the same tradition as Reid, and also as Moore,[1] and how the problems for the theory of objects, which is a refinement of a nonreductionist commonsense position, arise from warranted commonsense assumptions.

§2. *The structure of commonsense theories and commonsense philosophy.* A theory, in a comprehensive logical sense, is[2] a class of statements closed under certain (logical) operations. The commonsense theory is the class of statements of commonsense closed at least under such operations as simplification and adjunction (i.e. A & B belong to the theory iff A and B each belong to the theory). Commonsense is not a logical theory; for it is not, it would seem, closed under logical consequence. The logical working out of commonsense may well lead away from commonsense. Commonsense is rather a set of beliefs, (beliefs are represented propositionally in a theory) and like other theories comprising propositions of belief, not all consequences of what is believed are believed. In refining commonsense into a coherent and logical theory one of the first measures to be taken then is to close the theory under logical consequence. This already suggests one corollary, that refined commonsense has its problems, which arise when the consequences of commonsense may diverge from apparent commonsense, as happens with paradoxes. It may be unkindly said that the working out of the theory of objects as a development of commonsense provides adequate confirmation for this corollary.

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[1] The two main works in English on Meinong, Findlay 63 and Grossmann 74, both compare Meinong with Moore. Only Findlay considers (and that in a superficial fashion) the commonsense bases of the philosophies compared. And both accounts are inaccurate and unsatisfactory in other respects, e.g. Findlay's because of the simplistic claim that 'each is responsible for one great idea' and the ideas listed, and Grossmann's because of his very misleading view of Meinong's philosophy primarily in terms of the development 'over the years from a sparse ontology into an ample one', and because of the differences he alleges in general characterisation between the development of Moore's views and Meinong's.

[2] In the loose sense common in reductionistic mathematics. Strictly a theory is given by, i.e. is a certain function of, a certain class of statements.

Closure under consequence is only the first of several refinements that philosophers of commonsense would presumably wish to impose on properly refined commonsense. Much more difficult to formulate sharply are other sorts of refinement. One is the winnowing out of prejudice and superstition from the initially given beliefs of commonsense. Commonsense itself has usually suggested a distinction between the propositions that are basic and stand in need of no further argument, and those that are not so basic but belong to theoretical superstructure. The proposition that God exists, for example, was not regarded as basic in this sense even at times, such as those of Reid's Scotland, when it was a commonplace doctrine.[1] Argument was still required, if only for the Fool. More difficult to separate out than the overt theses of a theory of nature, or the universe, or of religion or other life-directing theories, are doctrines as to man's place in nature, his relations to other animals, his entitlement with respect to natural objects, and so forth. One way perhaps to remove prejudices of this type is to require that genuine principles of commonsense be transcultural. Such a requirement also removes the existence of a god of this sort or that sort from commonsense propositions. But the most satisfactory way (I can see) to avoid problems of all these types is to adopt the route Moore took, to list, insofar as required, basic assumptions of commonsense: this is like listing the axioms of a theory.[2] Although practically everything in Moore's splendid list of truisms can be retained - there is a world external to us, there are material things that exist independently of us, with quite ordinary properties such as being brown, solid, and of definite size, there are other people, with thoughts of their own - other propositions need to be added. Furthermore the list can be open-ended, open to extension, and presumably to some revision, and some statements in the list may have less certainty than others, though any that are uncertain will be rejected. Refined commonsense theories will not then be uniquely determined.

The axioms of commonsense, though commonly regarded as uncontroversially true, do not have to be sceptic-proof, philosopher-proof, or incapable of being criticized or doubted. No statements occupy the latter position; for just as any statement can be assumed, so any statement can be doubted even if in no way in doubt, even if self-evident (cf. Routley^2 75). This meets one of two serious difficulties Grave raises (in 67) for Reid's defence of commonsense against philosophical scepticism, and (in 60, p.119) generally for commonsense, namely if the truths of commonsense are self-evident, how can they be denied, or how can there be dissent from them. People, philosophers for instance, can dissent from what is self-evident. Grave's other difficulty - namely if these truths are self-evident how can they be made evident when denied - can be met, for example in Moore's way: even the self-evident can be argued for, and its evidence elucidated.

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[1] According to Grave (60, pp.146-7):

> The question of God's existence they hold to be almost answered by commonsense ... the existence of God is inferred ... the premisses (the two which Reid requires) are supplied by commonsense.

The main principle of the inference to the existence of God is that 'design or intelligence in the cause may be inferred with certainty from the marks or signs of it in the effect.' This principle Reid ascribed to commonsense (Intellectual Powers, VI. vi), thereby revealing the extent to which his commonsense philosophy was a theory which went rather far beyond the initial harder data supplied by commonsense. Moore stretched "commonsense" almost as far, commonsense leading to the propositions of sense data theory (in Moore's famous 'Defence of Commonsense', in 59). In showing that the theory of objects is commonsense no such testings of the notion of commonsense are required.

[2] The resemblance of the principles of commonsense to mathematical axioms was pointed out long ago by Stewart: cf. Grave 60, p.149.

It is important to be somewhat more specific as to the character of the axioms, since these are what distinguish a commonsense theory. The axioms are first truths: according to Buffier first truths have these characteristic marks:

> No attack upon them, and no attempt to prove them can operate from premisses that surpass them in clarity or evidence. They are and always have been, acknowledged by the vast majority of mankind. Those who imagine they reject them act like men in conformity with them (Grave 67, p.156).

These marks have their problems, but with some qualification they can be accepted; and they can be added to. For example, the initial truths, or axioms, should be transcultural in character.

A commonsense theory is restrained not only through what it accepts, as it must include sufficiently many basic commonsense assumptions, but also through what it rejects. Such a theory cannot reject basic commonsense assumptions, nor can it systematically reject hard data claims as to what is so.

In summary, a refined commonsense theory c is represented by a class of statements:

(i) containing sufficiently many basic commonsense assumptions;

(ii) closed under deducibility, and under certain other logical operations such as adjunction;

(iii) excluding the negations of basic commonsense assumptions; and

(iv) excluding the negation of hard data claims.[1]

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[1] There is indeterminacy, of course, at several points in the characterisation, and perhaps some of the claims could be strengthened, e.g. in the tradition of Moore the assumptions of (i) would be reckoned not only true but certain.

A refined commonsense theory differs from critical commonsense, as explained in Grave 67, p.157 ff., in being much more theoretically structured. Critical commonsense concerns only the character of the axioms, their being open to revision and modification.

Then a *commonsense philosophy* is a theory which is a constrained extension of a refined commonsense theory, i.e. it is an extension, thus taking commonsense assumptions of (i) to be true, which excludes what the commonsense theory excludes under (iii) and (iv). A little more explicitly formally, c is represented by a pair $<\Delta, \Theta>$ with Δ giving what the theory includes, i.e. (i) as closed under (ii), and Θ giving what the theory excludes, Θ being disjoint from Δ in the case of a satisfactory theory. Then a commonsense philosophy is given by an extension $<\Delta', \Theta'>$ of $c = <\Delta, \Theta>$, i.e. $\Delta \subseteq \Delta$ and $\Theta \subseteq \Theta'$.

It should be evident that a commonsense philosophy may diverge drastically from what is sometimes called the philosophy of commonsense, i.e. (according to the Concise Oxford English Dictionary) 'accepting primary beliefs of mankind as ultimate criterion of truth'. Moore's philosophy was certainly not part of the philosophy of commonsense in this - rather revolting - sense, since although Moore took commonsense perception claims as certainly true he thought they stood in need of analysis and were capable of a deeper explanation. Nor did Reid, that paradigmatic philosopher of commonsense, fit under such a philosophy of commonsense rubric: nor any longer do most other commonsense philosophers. Although, according to Grave (67, p.156)

> philosophers ... who have argued from commonsense and for its beliefs have often thought of commonsense in this way [i.e. as an intuitively based *common consent*], they have ... as often thought of it in a more ordinary way, as the commonsense that is opposed ... to high and obvious paradox.

A refined commonsense theory may be seriously incomplete and underdetermined. It may lack even quite obvious connections between theses, it may lack expected syntheses, it may lack any explanation of its claims, it may give no answers to a great many questions that a philosophy would be expected to pronounce upon. Most important, a commonsense theory may give no account of how what it asserts is true or possibly can be so: these are gaps that an extension may fill by transcendental arguments. It is elaboration of these matters, the filling of these or some of these gaps that leads from a refined commonsense theory to a commonsense philosophy. As a result of the extension too, a commonsense philosophy may assert things, especially things in more technical terminology, that sound strange to commonsense ears not attuned to such constrained extensions of commonsense. Just this happens with Meinong's theory of objects, simple variants of which are, so I am going to contend, (part of) a commonsense philosophy. The basic reason for this is that the theories only add constrainedly to commonsense connections and linkages which fill it out - with a view to obtaining such features as coherence, explanation, synthesis, and so on.

Not any extension of refined commonsense will do. A commonsense philosophy should meet certain conditions of adequacy. An important, but far from sufficient requirement, is that of nontriviality: not every statement should hold on the philosophy, some separation of falsehood from truth should be effected. In fact if the closure of basic commonsense is nontrivial, as was assumed - perhaps without sufficient warrant - then a commonsense philosophy, since a constrained extension of the closure will also be nontrivial. Other piecemeal conditions of adequacy are not too difficult to locate; more sweeping criteria, such as those that go under headings such as coherence, are much more difficult to nail down.

§3. *Axioms of commonsense, and major theses.* To reveal the theory of objects as a commonsense doctrine, as part of a commonsense philosophy, it is important to enlarge upon Moore's truisms, or axioms, of commonsense (in 59, pp.33-4). Recall that these axioms included such propositions as the following:- The earth has existed for many years; its inhabitants have been variously in contact with, or at different distances from, one another and other things. In particular (p.34),

> ... I have had expectations with regard to the future, and many beliefs of other kinds both true and false; I have thought of imaginary things and persons and incidents, in the reality of which I did not believe ... .

It is but a very small step from Moore's generalisations of those truisms (under heading (2), p.34-5) to two further important commonsense axioms, not explicitly cited by Moore but representative of axioms of metaphysical relevance:

Axiom M1. We can and commonly do make true statements, of kinds that can be readily indicated, about what does not exist. We can think correctly and talk truly about what does not exist.

Let us call the items concerned, items which do not exist, nonentities. These nonentities will be of various different sorts, as the next axiom begins to assure us.

Axiom M2. Not all nonentities are the same. Nonentities are of many sorts, in particular some are possible and some are impossible.

Both assumptions were taken to be merest commonsense by Reid:

> Indeed I know no truth more evident to the commonsense and to the experience of mankind [than that] men may barely conceive things that never existed ... they know that they can conceive a thousand things that never existed ... [a man may] conceive a centaur, he may have a distinct conception of this object, though no centaur ever existed (Reid 1895, pp.368-9, my rearrangement).

Just because these propositions are cited as axioms - in the colloquial sense - it is not to be taken that they are merely self-evident and cannot be defended or even deduced from more aseptic principles. For example, it follows from the fact that the Icosohedron is different from the Dodecahedron or that Pegasus is different from Chiron that not all nonentities are the same. That is, the axioms may be defended by appeal to the hard data.

It will be protested that in stating M1 and M2 in the way given, the issue has been prejudiced against reductionist theories. M1, for example, which is, it is said, far too theoretical for commonsense, should be restated at least in the form:

Axiom M1'. We sometimes make true statements purportedly about what does not exist, and preferably in more aseptic examples. But M1, not M1', is what commonsense assures us of. Moreover as far as the sorts of arguments to be advanced are concerned changes of this kind can be admitted. The arguments will take us back to M1.

There are two major theses to be argued:

(A) A theory of objects fits with commonsense, in the sense made more precise, that it is a constrained extension of commonsense.

(B) Only a theory with central assumptions in common with a theory of objects, in particular rejection of the Ontological Assumption, can fit with commonsense.

Eventually one might hope to prove these propositions, in particular (B) for which it is only necessary to know some of the axioms of commonsense and some hard data which rival reductionist theories violate. Proof of (A) may look a much more difficult business because not only is a sufficient axiomatisation of commonsense apparently required, but more of the character of the hard data has to be known as well. In fact comparatively weak underdetermined theories stand a much better change of fitting with commonsense, as the following sort of arguments reveals. Let c = $< \Delta, \Theta >$ be a refined commonsense theory which includes axioms M1 and M2, and let d be the extension of c by subject variables, the universal predicate 'is an object', the truth-functional connectives '&', '∨', '~' and the quantifiers 'for every object' ('U') and 'for some object' ('P') subject to the axioms of quantificational logic (with the rule (γ) of material detachment restricted in its application to the imposed logical theory and consistent extensions thereof) and to the axiom 'for every x, x is an object'. Then d is certainly an extension of c, it contains a weak logical theory of objects, and the only hard question is whether it is a constrained extension. But if the underlying theory c does not include the logical operators, as it may well not, then because there is no interaction of the extension with the underlying theory, the extensions would be constrained. All this, even if right, only shows that a quite weak theory of objects fits with commonsense, not that a more full-blooded theory like Meinong's does. But it is a useful start on which we can build by more indirect and circumstantial considerations.

There are other less theoretical bases from which a start can also be made. One, which won't however bear too much weight, is by direct appeal to the commonsense phenomonological character of Meinong's investigations. Findlay 73 has brought out the extent to which Meinong was a phenomenologist and how in important respects his work was purer than that of Husserl; however the reductionist anti-commonsense directions in which phenomenology has led are familiar enough. A better start is by appeal to the sort of commonsense data which Meinong expected his theory of objects to respect.

> Meinong [and] ... Moore ... share ... the same sensitiveness and deference to what people actually believe and commonly say ... and ..., though many would question it, the same common sense, in the sense of an unwillingness to abandon what we plainly understand and know, and what forms the firm foundation of our discourse, at the behest of theories much less lucid and indubitable (Findlay 63, p.ix).

This may be confirmed not only by detailed examination of Meinong's work; it may also be confirmed by such circumstantial evidence for the commonsense character of the theory of objects as that it gives something like the naive approach to the solution of many fundamental logical problems (see, especially, Castañeda's argument in 74), and that it solves all, or almost all, the philosophical puzzles over naming and denoting in a natural way (as Linsky in effect remarks in 77).

Another good start, which again strictly calls for much documentation, is with Reid's philosophy. Reid was a philosopher of commonsense par excellence, and yet Reid's philosophy, a clear example of a nonreductionist philosophy conforming in leading respects to the Idiosyncratic Platitude, incorporates essential features of a theory of objects, e.g. the Independence Principle (1895, p.403) nonexistential quantification (e.g. p.368), and most important rejection of the Ideal Hypothesis or Theory of Ideas, an epistemological version of the Reference Theory.

Indeed features of Meinong's theory of objects which offended the "robust sense of reality" of Russell and others were already an integral part of Reid's commonsense philosophy: this "robust sense of reality" is little more than a penchant for applying the Ontological Assumption, a prejudice Reid explicitly rejected. Thus if Meinong's work remains a scandal, a very similar commonsense theory of objects can be built up from the philosophy of Reid and other commonsense philosophers. Finally, there is evidence now coming in from defence of theories of objects, for example of this sort: if the commonsense answer is given to new difficulties the theory encounters, then this turns out almost invariably to be the answer that the theory delivers, or should deliver.

Defence of (B) is also part of the case. The argument for (B) is, in initial form, simply that no analysis or reduction of common true statements purportedly about nonentities to true statements about entities can be given which does not violate the hard data. It is known that all the standard theories of descriptions, which were designed to undertake this sort of job, break down on quite firm data (see, e.g., chapter 1); and a more general argument that all such theories are bound to break down can be designed (it is given in chapter 8). The conclusion is that no adequate reduction of talk about nonentities to talk about entities can be effected. That is, a reasonably comprehensive commonsense philosophy will contain at least the rudiments of a theory of objects. The next task is to build on the rudiments.

§4. *No limitation theses, sorts of Characterisation Postulates, and proofs of commonsense.* Meinong's Independence Thesis - according to which Sosein is independent of Sein, according to which objects have definite characteristics even though they do not exist - in its various and fuller formulations combines, or connects, several different, commonsense, principles which it is important in logical investigations to separate out.

1. No limitation (or Freedom) theses. These theses come in several forms, for assumption, for consideration, for imagination, and so forth (for wishing, thinking, doubting ...). According to the Unlimited Assumption Thesis there are no limitations on what one can assume; one can assume anything one likes, no matter how bizarre, inconsistent or paradoxical.[1]

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[1] The Thesis is a purification of Meinong's principle of freedom of assumption, for which see, e.g. Mog, p.282 ff.

A direct analogue of the Unlimited Assumption Thesis is the Unrestricted Imagination Thesis fundamental to a comprehensive theory of fiction, that there are no restrictions on what is imaginable (even the unimaginable is imaginable). There is, as in all these cases, only one major catch: what is assumed may not in fact have all the properties it is assumed to have. The reason for this catch, if not obvious, will become so: one may consider, or wish for, a round square which exists, but that won't lift the object out of Aussersein.

Now assumption is propositional: a creature assumes that so and so, where the so and so is typically specified by a sentence. Unlimited assumption is reflected in a logic through no limitations on the propositions it can consider - any statement at all can be represented in its notation - and no limitations on the propositions that can be assumed in hypothetical arguments and proofs. Most logics now allow for these things, up to a point: up to the impossible, but not into the paradoxical. One can assume, and in reductio proofs characteristically does assume, what is impossible. But one is barred, by stratification theories of one sort or another, e.g. order theories, levels of languages theories, from assuming what is paradoxical, e.g. from assuming that what one is assuming is not the case. This classical distinction in the propositional case between the impossible and the paradoxical or defective we find in Meinong in the object case: and really, since propositions are objects (of higher order), the classical case is just a special case of Meinong's more general separation.

In terms of the freedom thesis there is no basis for this classical restriction to the nonparadoxical. Nor does commonsense support the restriction: on the contrary natural languages, which tend to mirror commonsense, are conspicuously free of stratification, and provide no warrant at all for levels-of-language impositions or the like. The admission of paradoxical assertions into a logic - into what remains of the object language - though an important step in the direction of dialectical logics, does not of course settle the logic of the assertions admitted: this depends on the issue (under II below) of how these propositional objects are characterised.

Let us generalise then from propositions to all objects.[1] According to the Unlimited Contemplation Thesis there are no limitations on what one can consider or contemplate: one can consider any item at all, no matter whether or not it exists, or whether it is possible or not, or whether it is paradoxical or not. Once again, however, these objects will not have all the features they present themselves as having. The objects which present themselves as, respectively, the perfect existent being and the class of all classes not members of themselves will be regarded with some suspicion these days, much as the representative at the door is not accepted except by the unduly naive as the person his introduction card says he is (certainly not without a good deal of independent investigation in many cases). But with objects other than those we've been taught to beware of many of us are like the unduly naive; for we've been brought up philosophically with the Reference Theory and with regular existent objects where assumption never goes wrong. It is not that nonexistent objects are devious or less trustworthy: it is that one mistakes their logic if one assumes that, like entities, they have all the properties they present themselves as having. Consider, to get the feel of the direction we shall have to travel, the following object: the oil rig that is 2 miles due north of Tangiers and 2 miles due south of Capetown. If this oil rig's credentials were accepted, it would follow that Tangiers is 4 miles south of Capetown. But there is nothing to stop us considering the object.

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[1] It is worth emphasizing that propositions offer a valuable model for objects: for arguments for the objectivity and irreducibility of propositions, though not undisputed, are well known and widely accepted. Compare also worlds, objects which offer, though perhaps to a lesser extent, somewhat analogous advantages in explaining the situation with respect to objects in general.

These considerations answer the question: why can't we think of objects that violate the logical laws, any logical law at all? The answer is that we can - only in a coherent theory, the objects won't have all the properties they are thought of as having, that they present themselves as having.[1] It is here that the separation between logic and the axiomatic disciplines, such as geometry, appears to come; for one can have objects which genuinely violate their axiomatic principles (at least as they are usually formulated).

Unlimited consideration should be reflected in a logic, and in a satisfactory language, through no limitations on the objects it can consider or describe - any object at all should be representable in its notation (Hilbert's theory, Hilbert-Bernays 34-9, fails here) - and no limitations on the objects that can be reasoned about, generalised or particularised about, and so on (all logics except neutral logics fail here). Yet surely what is good enough for impossible propositions, e.g. quantification over them, should be admissible also for other sorts of impossible objects.

Once again the freedom thesis leads to the removal of classical and other restrictions (including those of so-called 'free logics' which are much less free than the medieval free cities). Quantification logic, duly reinterpreted over domains of objects, extends to all objects - and there is nothing at all to prevent pure quantificational logic so extending to all objects (to reiterate, important changes from classical formalism only begin with identity and description theories). And once again the removal of classical interpretational restrictions is supported by commonsense: classical restrictions are not incorporated in natural languages, but only in the classical canonical strait-jackets philosophers characteristically endeavour to force natural language into.

The way the initial clauses of the semantics of neutral quantification logic go are very straightforward. To illustrate: "Pegasus is winged" is true iff the item 'Pegasus' is about, namely Pegasus, has the property specified by 'is winged', i.e. that of being winged, i.e. iff Pegasus is winged. Such clauses, which are admittedly low in informational content, form a much more comprehensive class than classically. For there is no restriction on well-formed subjects to logically proper names: any ordinary (or extraordinary) names, or for that matter any singular subjects or descriptions, can be admitted whether they are about what exists or not. Thus singular descriptions can serve as direct subjects and as substitution values of variables. Accordingly a great many subject-predicate expressions of English, rejected as misleading in classical logical analysis, are in order as they are and admit of direct treatment in neutral logic. In short, neutral logic, unlike classical, is an appropriate vehicle for the formulation of freedom assumptions congenial to commonsense.

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[1] Hardline referentialists are properly obliged to object to both.

2. Characterisation (or Assumption) Postulates. These postulates also come in several forms - assumption or reduction postulates in the case of individual objects, abstraction or comprehension postulates in the case of classes, attributes and propositions. But in their completely naive, and theory-trivialising form they assert that an object has all the properties it presents itself as having: an object which is f is f, the object which is f is f, and so on. In order to stop things going completely haywire, this assumption postulate naively transferred from the logic of entities - where it holds - to the logic of nonentities, which platonists (and others) mistakenly take to be the same - where it certainly fails - has to be appropriately qualified.

The Characterisation Postulates for the logic of entities, i.e. genuinely existing things, are comparatively straightforward, and take the following forms for different descriptors:

an cases, for both 'an' meaning 'an arbitrary' and 'an' meaning 'a certain': if an object which is A exists then an object which is A is A, i.e., in symbols: $E(\kappa x A(x)) \supset A(\kappa x A(x))$, (CPi)

the case: if the object which is A uniquely exists then the object which is A is A, i.e.: $E!(\iota x A(x)) \supset A(\iota x A(x))$, (CPii)

These postulates do not extend however even to possibilia, as simple cases of objects determining their own ontological status indicates. Consider, for instance, the actual fountain of youth to be found in Garema Place, assuming that to be a logical possibility. Then a full characterisation postulate for possibilia would make it true that there exists a fountain of youth in Garema Place. The conclusion is not that there is something wrong with possibilia, but that the logic of possibilia is not the same as the logic of entities.

The classical position is really that nonentities have none but a barely minimal logic, and, more precisely that characterisation postulates begin and end with entities, that (CPi) and (CPii) can be strengthened to biconditionals, that only entities are so assumptible. This goes along with the thesis that nonentities have no properties in their own right, they have none but derivative properties, these deriving from features of entities. The classical position is entirely rejected by Meinong, by noneism, and by commonsense, according to all of which nonentities have distinct, irreducible properties, from which it will emerge, by a transcendental argument, that limited characterisation postulates hold for nonentities.

Findlay argues that incomplete and impossible objects 'must have a definite internal makeup if only in order not to exist or not to subsist anywhere' (introduction to Meinong 72, p.xiii). This is a little swift. An item with no properties and no definite makeup, a nothing, will certainly not exist. There is no valid argument by Findlay's route to the assignment of characterising properties to nonentities. There are other arguments, however, to the conclusion that nonentities do have extensional properties (enough often to yield a definite makeup) and that some qualified form of the Characterisation Postulate holds. An important transcendental argument takes the following form:-

(1) Some statements of identity and difference are true (apparently) of nonentities, e.g. Pegasus is distinct from Cerberus, mermaids are distinct from unicorns.

(2) The truth of identity and distinctness claims about nonentities can only be adequately explained by supposing that the items themselves have properties. The same goes for likeness and unlikeness claims.

Given that 'Pegasus' and 'Cerberus' are about what they seem to be about, namely Pegasus and Cerberus respectively, (2) is immediate from (1). For if Pegasus is distinct from Cerberus some features must distinguish them, i.e. they must differ as to properties (or at least as to what is true of them). Nor can this difference be a merely intensional one. I cannot make Venus distinct from Aphrodite by mistakenly thinking that one is beautiful and the other is not.

But it may be denied (e.g. by those who espouse familiar concept or linguistic positions), that 'Pegasus' is about what it seems to be about. Contrary to common supposition, however, mere location of differences in associated concepts or the like (e.g. senses) - worse still in associated names - will not do. While (to repeat p.39) we might be able to explain the truth of a distinctness statement such as 'Unicorns are distinct from mermaids' by reference to the distinctness of the concepts unicorn and mermaid or the difference in the senses of expressions 'unicorns' and 'mermaids', we cannot similarly explain the truth of a contingent identity statement such as 'What I am thinking about is identical with a unicorn' by reference to the sameness of the concepts or senses involved, because they are not the same. And to explain the truth of the identity statement by identity of reference, by saying that the concepts apply to or the expressions refer to the same items, is to push the responsibility for the truth of the identity back to the items themselves, and therefore to admit that the items must have properties. Yet unless some other entities can be produced whose identity or difference can explain such contingent identity statements, we will have to fall back on the identity or difference of the items themselves, which implies that they have properties.

(3) The properties of nonentities cannot be purely intensional, but must include some extensional features. Firstly, we would not be able to assert the contingent identities we do unless some of the properties were extensional. Secondly, if all properties of nonentities were intensional there would be nothing for these intensional properties to focus upon. There would be nothing, for example, to distinguish thinking about Pegasus and thinking about Cerberus: certainly it could not be done by other thinkers thinking without a vicious circularity being induced. Not all objects, certainly not all commonplace public nonentities, can be characterised purely intensionally.

(4) Nonentities have the extensional properties which serve to characterise them. By (3) nonentities have extensional properties: how can they have these properties? Only in the end in virtue of their being what they are, by their characterisation. And this is the way we do in fact come to know many features - not all features - of many nonentities, not by observation but by assumption and deduction, as consideration of examples such as the Triangle reveals.

The transcendental argument only gives a limited amount of information as to the properties of nonentities. It does not indicate how properties other than those supplied by characterisation are arrived at. It does not indicate which of the extensional properties that a nonentity says it has in its own description, for example, it has. Which such properties nonentities do have, which properties are characterising will have to be determined, or delimited, by somewhat independent arguments, which impose appropriate conditions on characterisation postulates (some of the moves have been gone through in chapter 5).

It is in part through characterisation principles that the Idiosyncratic Platitude gets satisfied by the theory of objects. Every sort of item does have its own sort of logic: this is a result primarily of assumptibility, not simply, or even at all - as is often thought these days - of identity criteria. The identity conditions for entities and nonentities are exactly the same but the characterisation principles are very different. Some of the objects and their corresponding characterisation principles (argued for in the previous chapter) are as follows:

Sorts of object	Corresponding CP
entities	unrestricted CP
nonentities (of bottom order)	severely restricted CP, restricted e.g. to elementary characteristics
sets	set abstraction postulate
properties and relations	attribute abstraction postulates
propositions (and objectives)	propositional abstraction

The list is incomplete for there are of course other sorts of objects; and there may be further distinctions to be made. For example, there may be separate characterisation postulates for possibilia which do not hold for other nonentities. But, in any case, the logic of possibilia can be separated from that of impossibilia in other ways, e.g. through the fact that characterisations of impossibilia lead to contradictions, and the effect of such inconsistency elsewhere in the logical theory. That is, other logical features also contribute to the satisfaction of the Idiosyncratic Platitude.[1]

Whether the Characterisation Postulates which emerge render the theory of objects a paraconsistent or a consistent theory is an important matter, not merely for the assessment of the theory, but also for claims of the theory to be commonsensical. For surely commonsense does not accept inconsistency! A little reflection reveals however that the claim a commonsense theory cannot be paraconsistent is not quite so clearcut, especially when common reactions to the paradoxes are taken into account, e.g. the reaction 'Yes, that's true; yes, it's contradictory'. There is no need however, to introduce such controversial claims as "commonsense involves true contradictions" in order to defend even the paraconsistent theory of objects as commonsense. It is enough that the paraconsistent theory conservatively extends a refined, consistent, commonsense basis.

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[1] The Platitude may seem vacuous, but it is not entirely so owing to its nonreductionist bias. In particular, on rival classical theories, nonentities really have no separate logic, and so do not have their own sort of logic. Nonentities may appear to have something of a logic, but that is an illusion: on closer inspection this residual logic vanishes into the logic of entities.

6.4 ARGUMENT THAT THE THEORY OF OBJECTS IS COMMONSENSE

What remains to be argued, in order to make out a prima facie case for the theory of objects as commonsense, is

(C) CPs are either commonsense, or

(D) CPs can be made part of a constrained extension of commonsense.

Although examples of CPs have wide ordinary appeal, they are scarcely truths of the uncontroversial type accounted truths of commonsense. The precisely qualified forms of CPs are even further removed from commonsense. And the Abstraction Axiom for sets is doubtfully a first truth of commonsense - even if it is of mathematics. So it appears that the more difficult proposition (D) will have to be argued. But establishing (D) in detail is a very large order, larger than that hitherto required for any accepted philosophical theory. For it requires, as a part, a nontriviality-proof for paraconsistent set theory, since the Characterisation Postulate in the case of sets is just the Abstraction Axiom. Some important elementary bottom order cases of (D) can be argued (by applying the results of earlier chapters, especially 5.4); and these cases can be combined with a proof of the nontriviality of extensional paraconsistent set theory (as given in Brady-Routley 79). But the larger issue, as to whether the theory of objects appropriately formulated with Characterisation Principles for each sort of object is a commonsense theory, i.e. a constrained extension of commonsense, is an open question.[1] My conjecture is, of course, that the theory of objects is a constrained extension of commonsense, that is, is a (and perhaps the) commonsense philosophy.

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[1] Postscript: See now point 1, p.892.

CHAPTER 7

THE PROBLEMS OF FICTION AND FICTIONS

> The people were much bothered by the tricks of the Bullim-Boukan. The Boukan were two mischievous spirits in one. They were plural and indivisible, and only looked like one. That is why they were called Bullim, the Two-Boukan (Bunjil's Cave, p.76).

Literary phenomena provide a severe testing ground for logical and semantical theories; and certainly (at least until recently?) the phenomena have regularly revealed serious weaknesses in each new theory proposed. But typically the phenomena are not seriously considered; typically issues of much literary interest such as metaphor, simile, transference of sense, irony, satire, allegory, fictionalisation, and so on, are set aside at the beginning of logical and semantical studies, where the emphasis has always been on literal meaning and reportative discourse, to the cost of most of the remainder of discourse.[1]. The literary phenomena set aside are at best given perfunctory treatment after the important work of dealing with literal reportative discourse has been accomplished - to the very limited extent that even this discourse can be analysed on the main semantical theories so far proposed.

The serious neglect of literature, and its important and theory testing (and often defeating) phenomena, in modern semantics can be ascribed largely to the almost exclusive concentration of semantical investigations on what is taken to be the language of science and on its everyday linguistic counterparts concerned with chronicling reality, such as 'The cat sits on the mat'. Such discourse, which it was mistakenly supposed was, or need be, only literal, reportative, extensional and about things that actually exist, encompassed all that was of real philosophical importance; the rest, insofar as it could not be conveniently reduced to the this "clear and distinct" classical basis, was dismissed with various grades of abuse, ranging from "nonsense" down to "not really worth bothering about". Such was the position of the scientific semantics which obtained its roughest and toughest formulation with logical positivism and which persists, sometimes in almost unrefined form, in modern empiricism and its variants, such as pragmatism. Since it is empiricism which has inspired much philosophical analysis and practically all formal semantical investigation, positivist preconceptions about what is clear and distinct, what is basic and requires no further analysis, and what is fundamental and important, persist in most modern semantical work, superficially softened perhaps but largely unquestioned. Because of the reality fixation, not to say science worship, characteristic of empiricism, a narrow sample of scientific discourse has been the model in semantics, to the detriment again of non-reportive discourse.

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[1] In this study too, it has to be confessed, most of these issues - fictionalisation and the like excepted - are neglected. The universal semantical theory does, however, provide the apparatus for analysing such phenomena as transference of sense and metaphor. The key devices are those of context-induced world shift (much as with fictional statements) and worlds where semantic assignments result in extraordinary senses of certain expressions in these worlds.

7.0 ASSIMILATING NONENTITIES AND NONESUCHES

Semantical difficulties concerning certain literary phenomena, those of fiction and fictions in particular, are not however so easily set aside or separated from general semantical puzzles - puzzles firstly over talk about nonexistent things and about intensional discourse, especially the language of invention and of imagination and the language of scientific discovery, conjecture, and speculation; and puzzles secondly about scientific theories, especially false theories, which after all predominate among theories. As to the first, the logical theory, logic and semantics, of fiction and fictions is a special, and very instructive, case of any general logical theory of nonexistence and intensionality. As to the second, scientific theories, especially mistaken ones, closely resemble[1] fiction - much more closely than has usually been allowed by accounts other than fictionalism - but the main characters are commonly not human ones. Studies in ethology with animal characters as the main objects of study provide a bridge between fiction of the typical human chauvinist variety with humans and their often humdrum problems dominating the landscape, and the "fiction" of science where the main figures may be one or other elementary particles.

There have been attempts (e.g. in Woods 74) to sharply distinguish the cases here being assimilated, to make a distinction between nonentities (of fiction) and nonesuches (e.g. the phlogistons of science and the kings of France and Lilliput of philosophy); but the distinction, as made out, will not bear much weight. To the extent that the distinction (important in Woods' work) is explained by Woods at all, it is explained as follows (74, p.29):

> ...even though Holmes does not exist, we know who he is. He is a non-entity who is a somebody. The present king of France is a nonesuch [a nobody?]. Nonesuches do not fall within the values of ... bound variables. There are no nonesuches.

But wherein lies a difference of logical import? Nonesuches are not just like nonentities, they are nonentities, i.e. objects that do not exist; and Sherlock Holmes is a nonesuch in that there exists no such person. The suggestion is that fictional objects are somethings, objects that are quantifiable over and possessing properties; whereas nonesuches are none of these. However "nonesuches" are all of these, e.g. phlogiston is something, namely a heat substance with some fairly specific properties, about which we can truly say quantificationally that there exists no such substance, nonesuch. The present king of France, though hardly an object of modern scientific theory, is likewise quantifiable over, is a something in this sense, and also in the sense of having properties, e.g. he is a king and, less controversially, he differs from the present king of Australia, is distinct from Meinong's round square, and so on.[2] The differences between the objects reduce then to differences in source (a literary fiction having its source in works of fiction, and a scientific fiction in some group's theory); but these differences are removable and accordingly no bar to a general logical theory which comprehends them all.[3] For one thing, it is easy to arrange to have a theory presented as fiction, and conversely fiction often presents theories. In this way depauperate objects such as present king of France can be seen as limiting cases of fictional items: as they have no source book, apart from what is given by their descriptions, their only features are those of their descriptions together perhaps with what follows therefrom. But such an assimilation of fictional objects with the nonentities of scientific theories and of erroneous history (purportedly real objects) cuts two ways: for though it means that the problems of fictions are not so readily evaded even in the semantic analysis of scientific discourse, it also means that a theory of real objects is by no means independent of a theory of fictional objects, and hence that any properly comprehensive theory of objects (or descriptions) is obliged to supply a theory of fictions.

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[1] Nonetheless the resemblance is only a resemblance (contrary to a main tenet of fictionalism, cf. chapter 11). Differences between theoretical objects and fictional objects will be brought out in what follows (§10).

[2] He is rather the object of an untold pseudo-history which extends to the present.

[3] This is not to say that classifications of objects that do not exist into various sorts, e.g. fictional objects, theoretical objects, pseudo-historical objects, etc., are not of logical significance: quite the contrary.

§1. *Fiction, and some of its distinctive semantical features.* The failure (soon to be perfunctorily observed) of most marketed philosophical and semantical theories to cope with just one group of literary phenomena, that of fiction and fictions, is a minor theme in what follows: the major theme is the more vexing one of trying to locate minimal adjustments to comparatively naive, and commonsensical, theories of fictions - at least to the extent of clarifying when, and how fictional statements are true - and to devise a semantical analysis, fitting into the general framework of universal semantics (of chapter 1, §24), for the resulting adjusted account. Since the availability of a universal semantics, a semantical analysis for every language, induces the reasonable belief that the semantics of fictional discourse, whatever it is, can be accommodated in the general theory, the enterprise of determining the semantical structure of fiction reduces to an exercise in applying the semantics to the data, if only the literary data can be fixed. But the availability of a general framework makes the determination of the semantics of fictional discourse, even if rather more of an applied venture, only a few degrees less difficult.

Delimiting the field of enquiry and the region from which literary data are to be drawn, though not without its difficulties, is not a serious obstacle to semantical investigations. Standard dictionary accounts of fiction serve to define the field sharply enough: literary fiction comes in both spoken and written forms, in spoken forms as legends, sagas, epics, stories and tales, as contrasted for example with spoken reports, statements, descriptions, summaries of facts, briefs; and in written form as works of fiction, novels, short stories, shockers, written tales, fables, as contrasted with reportive narrative, history, memoirs, written reports. A piece, or work, of fiction typically has an author or set of authors (perhaps unknown or anonymous) and is intended to reach some audience: thus it is a communication, or message, in the wide sense. More generally, (a piece of) fiction is authored discourse (whether written or spoken) or communication which consists of imagined or invented statements or narrative, which conveys a story as contrasted with factual or reportative discourse. A work of fiction will generally be about fictional items or creatures (i.e. characters), that is the story is about fictions in another important sense of that term.

The more general communicational account (or something like it, e.g. an account in terms of theories of certain sorts) is required because a piece of fiction or of make-believe may involve both much more than discourse and much less than discourse. For example, a film or television show, unlike a bedside story or fireside tale, may aim to absorb the audience visually as well as auditorily, and evidently the film experience could be expanded to involve other senses as well. Since a film may be silent and contain no script, discourse in the usual sense, though characteristic of fiction, is not essential for nonliterary fiction: potential communication or portrayal of an imaginary situation through some medium is. It is also open to question whether the characteristic features of communication, a sender and a receiver or, in the case at hand, an author and an audience, are required. Certainly in many cases no audience (other than the author) is reached, or need be reached, by a work of fiction, and exceptional circumstances can be envisaged where an unauthored piece of fiction turns up, an objêt trouvé. Suspending such characteristic (though not invariable) distinguishing marks of fiction enables us to see the extent to which a work of fiction is, semantically at least, like a theory.

The bounds of fiction are those of imagination, together with the resources of the language used. Naturally not all imagined worlds - certainly not all imaginable worlds - are recorded in fiction. But the author of a work of fiction can try to set down whatever he imagines; and the free range of imagination is virtually unlimited.[1] It is not bounded by laws of nature or even by laws of logic: it is not restricted to possible worlds. Nor is there a problem in portraying or envisaging scenes where violations of natural and logical laws occur, or in describing characters (like the Bullim-Boukan) who violate these "laws". Let us imagine a further James Bond novel, for example, in which Bond proves that $E = NR$: of course we don't, and can't, get or expect full details of the proof, since such a proof is impossible (because $\Box(E \neq NR)$). This one example thus displays two features of fiction that put it beyond the reach of most going semantical theories, namely possible inconsistency and invariable incompleteness (both of the world portrayed and of objects portrayed). It is time to try to bring out these features in a more systematic way.

A work of fiction, e.g. a novel or film or series of such, N can be regarded as depicting a (dynamic) world,[2] the world of the story. The world a(N) is given (in a canonical form) by the class of statements that hold according to N; it has as domain d(N) the items of N, e.g. the characters and things which it is about. There are some difficulties in determining, and some unproblematic elasticity in, what holds according to N. For what holds according to N does not coincide with what is presented by, e.g. written in, N. Much as the source book for a character of fiction does not simply coincide with what is said in the authentic books or works depicting the character, so the world of a work or series of works does not simply coincide with the sum of assertions of the work(s). How does the world **a**(N) differ from what N asserts, or is taken to assert? There are two possibilities:

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[1] The logic of fiction, science fiction in particular, has much in common with the logic of the ultramodal functor 'It is imagined that', the semantical evaluation of which calls for worlds far beyond those of modal logic semantics. Likewise fantasy can deploy worlds remote from the natural order of things.

The account given of fiction is intended to be general and to cover all the varieties of fiction in the main modern sense, including (with at most minor variations) drama, opera, soap opera, etc. Subsequently some other varieties of fiction will be noted, and fiction (in a narrower literary sense) distinguished from myth, legend, and fantasy.

The extended (theory-laden) senses of 'fiction', where fiction includes theoretical objects or legal objects or, quite generally, every object that does not exist will also be considered subsequently - and rejected. For they write in assumptions as to the similarity of, e.g., fictional objects and theoretical objects that it is important to reject.

[2] Or part of a world, or a system of worlds. But each subworld or world-system can be taken as a world; compare the situation with source books, chapter 1, §25. a(N) is the source world for N.

(1) Through addition of further statements not made in N;

(2) Through subtraction of statements from those (apparently) made in N.

The first, addition, way is most important; but it is doubtful that the second, deletion, way should be admitted, and it certainly makes for a clearer and more assessible theory if it is not. For then the statemental representation of **a**(N) is just an extension of what is asserted in N. Furthermore, admission of subtraction is a most serious obstacle to the formulation of a satisfactory theory of how **a**(N) is determined from N, and so also in the way of a theory of interpretation. For interpreting a work N overlaps the matter of working out **a**(N). Is there good reason for allowing deletion? For special purposes there may be, e.g. if the object is to determine only part of what work N conveys, e.g. the political theme, a minor plot, etc: but such reasons evaporate when the object is to determine world **a**(N). For example, the natural and cosmic forces at work in (almost any) one of Hardy's West Country novels may not figure in recounts of the plot of the work (though they are relevant to what transpires), but they are very definitely part of the world portrayed, and should not be deleted. More questionable as regards inclusion are *ir*relevant moralising included in a work or general observations on the state of the world, human psychology, etc. which have (as they may have in a *bad* work) little or nothing to do with setting the tone, mood, and background effects for the carrying of the story. Such material, while it may not add to the definition of the world concerned, does not (because of its irrelevance) significantly interfere with it either, and can simply be carried; that is, subtraction is again not required.

What has made the admission of deletion appear compulsory is the modal account of *worlds*. But while deletion accounts *are* forced by classical and modal theories, relevant and ultramodal theories can avoid them. The modal problems arise thus: once addition to worlds or enlargement of worlds is considered, as it often has to be, e.g. in treating fiction, in assessing counterfactuals, subtraction has also to be admitted, since addition can destroy properties of modal worlds such as possibility and/or completeness; and subtraction from worlds is very difficult to control technically. With the larger class of worlds ultramodal theories include, these problems vanish: addition does not have to be coupled with subtraction.[1] Accordingly it can be safely assumed that subtraction does not apply, that **a**(N) results from what N says by addition principles only.[2]

It remains, then, in indicating how **a**(N) is determined to indicate how and where addition is legitimate. The principles underlying addition may be divided into two groups, *material elaboration* conditions, and *formal closure* conditions. The material additions include factual or quasi-factual material, e.g. descriptive geographical or historical material, alluded to in setting the scenes of N, that may be made use of in N, but which is not explicitly spelt out in N. The material - which consists primarily of relatively common knowledge of parts of the current world and its history - may include, usually in very sketchy form, such geographical information[1]as the arrangements of certain streets of London, of the upper reaches of the river Thames, of a minor rail network and its stations, of the climate of a certain region; such historical details as the prime minister of a certain government, parts of a genealogical tree of an "important" family; such scientific information as that normal physical forces, like gravity, operate on characters[2] and that characters are in main psychological and sociological respects like sometime-actual humans of such and such a place and time; knowledge of other works of fiction or the like in the tradition of which the work is a part; information as to social customs; etc. How much material of this sort goes into **a**(N)? Since the limitations of modal semantics have been removed there is no requirement to *complete* fictional worlds. Rather the opposite of a maximal principle of the type completion leads to seems to be wanted, namely *a principle*, if not *of minimal* required *additions*, at least of a very conservative type. Roughly, the additions should be enough to encompass the material the work alludes to or relies upon but does not set down explicitly, enough to enable the story to be understood and avert certain misunderstandings, and no more. It should *not* include empirical, logical, or other information extraneous to the work and unnecessary to its the comprehension (all this is suspended).

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[1] This is the genesis of R. and V. Routley's impossible theory of counterfactuals, on which see RLR. It also underlies the way in which ultramodal theories are able to avoid crippling total evidence requirements of modal theories: see UL.

[2] Since it is what N states that is the starting point, syntactical errors such as mistaken grammar, misprints, etc. in a script of N are automatically eliminated.

The closure principles are also much more restrictive than is often assumed, definitely more restrictive than modal accounts, which allow closure under strict implication, suppose. For a fictional world may well not, and generally *will not*, include all necessary truths. Closure under a *good* logical consequence relation is certainly not sufficient to account for additions admitted, in virtue of material principles; nor (as we shall see in more detail) is it necessary. Commonly, however, what holds according to N will include the entailmental closure of what is stated in N; i.e. if $A_1,\ldots, A_n$ hold in N and A_1 &...& A_n entail B then B holds in N. But in exceptional circumstances such closure can be varied, by switch to an idiosyncratic entailment connection (determined by N), or waived altogether. It may be suggested that, on the contrary, closure under entailment of **a** (N) is not even commonly required.

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[1] When such details are not generally known to intended audiences, or - differently - are invented, sketch maps are sometimes supplied, giving requisite information.

[2] Not the general scientific laws, but relevant instances of them.

The account given of material principles of addition leaves much to be desired; it is (inevitably?) loose, open-ended and awkwardly intensional; and it can almost certainly be improved upon to some extent.

This issue may look rather unimportant for ultramodal noneism, since worlds not entailmentally closed are easily included under the semantical theory. But the matter will turn out to be of larger import, and to involve the question of whether **T** belongs to **K**, i.e. whether the real world is logically normal, or at least commonly so.

The questionable assumptions that seem to underlie this suggestion are worth exposing. They are, firstly, a modal-based assumption that the admission of inconsistency of fictional worlds, even if it cannot be ruled out entirely, is to be avoided, in particular amputable remote inconsistencies are to be excluded, and, secondly, that a(N) somehow represents what the audience understands from N. The argument against entailment closure of a(N) runs as follows: works of fiction, such as N, can be envisaged which are such that if the consequences of (widely scattered) statements of N were drawn out inconsistent statements would result, i.e. N leads to remote inconsistencies; but these inconsistencies are not part of the (ordinary?, intended?) audiences' understanding of N. The reply is that while a(N) may include all the basic information necessary to understanding N (insofar as N is intelligible), it need not include just that, and often does not. In short, what is (part of) a necessary condition on N has mistakenly been inflated into a necessary and sufficient one. In fact a smarter than ordinary member of the audience may eventually detect the inconsistency; so presumably it should be included. In any case an inconsistency in a(N) does not matter and there is no need to exclude it. There are other reasons for imposing closure under inference as a common requirement. For instance, certain works expect the audience to make inferences, draw conclusions, etc. It is evident that closure under entailment is only one of the principles commonly presupposed. For each work N there is, then, a set of rules, depending on the sort of work N is, under which a(N) is closed.

The strategy here adopted of determining worlds from works of fiction is the reverse of the move in Jeffrey 65, who tries to explain possible worlds in terms of a class of novels, namely consistent and complete ones. The inadequacies in Jeffrey's move begin to reveal the nature and range of the worlds of fiction. Firstly, no novels are complete in Jeffrey's sense of including at least one of the statements A and not-A for every statement A, and indeed where the domain of items considered in a novel is not finite a complete novel is impossible given that all novels are of finite length. Secondly, some novels are not consistent, in that they include statements of the form A and also of the form not-A for some statement A.

It is evident enough in fact that the worlds of fiction may be very bizarre and deviate enormously from the actual world T, which can be represented by the class of true statements.[1] (Only realistic and historical novels perhaps are intended to mirror, in small part, the real evolving world T.) The extent of the deviation is important both for the semantical analysis of fiction and for determining conditions of adequacy for a theory of fictions. Firstly, as with what, and what worlds, can be imagined, so with the worlds of works of fiction: there are in principle *no* restrictions as to kind. There can thus be no restriction of the worlds required for a semantical analysis of works of fiction, of fictional discourse, to the possible worlds of most modern semantics: very many of the worlds of a universal semantics, which go far beyond the possible, are required to account for the potential range of works of fiction. Not only the class of worlds goes beyond the possible, their structure far exceeds what is tolerated by modally determined semantics. In particular, fictional worlds can be combined to yield other worlds, their unions; for example, the worlds of *The Hound of the Baskervilles* and of *The Sign of Four* and also of the other Conan Doyle Sherlock Holmes' stories can be integrated to yield the world of Sherlock Holmes, as represented in all the Doyle stories (or, differently, the Doyle stories and stories of the Holmes' tradition). The union of complete possible worlds (i.e. modal worlds) is not in general such a world; in the Sherlock Holmes' case it is certainly not, because of incompleteness and of internal inconsistency between the Holmes stories.

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[1] Though a world can be *represented* by (and is isomorphic to) a class of statements, it is not, in general, identical with such a class of statements, as the case of worlds portrayed by silent films reveals (an important point made by C. Mortensen).

Even so very many of the worlds of universal semantics are not fictional worlds, for two reasons:- They have no author or set of authors; they lack structural requirements of coherence, continuity, organisation, and so forth that distinguish fictional worlds, even those of rather bad works of fiction, from other worlds; and often they satisfy requirements that fictional worlds do not, e.g. they are normal, complete, etc. In short, then, a *fictional* world is a world (of the universal semantics) which typically is authored, which satisfies structural requirements,[1] and which fails to fulfil other requirements, such as those for modal worlds.

A second upshot is that the thoroughly naive theory according to which fictional statements are always true on the author's sayso has to be rejected - or at least substantially qualified, e.g. by distinguishing separate classes of "fictional truths" different from author ratified statements (in which case the theory will tend to converge with the supplemented contextual theory to be advanced subsequently). There are three reasons for this. Firstly, the world of a work of fiction may diverge from what an author says. There is commonly more than an author explicitly ratifies to go upon, and sometimes there is perhaps less than the author asserts in the work or (especially) later, when s/he may become just one more interpreter of the work. Secondly, among the truths of **T** are at least the logical truths (i.e. **T** is logically normal), but there are fictional worlds in which any given logical truth (or theorem) fails to hold or is violated. Where **c** is such a world **c** is not included in **T**. Consider the new James Bond story again and let the world of this story be **d**. Since **T** is closed under entailment and x proved that A entails A, it would be the case that if James Bond proved that E = NR were true, i.e. belonged to **T**, E = NR would also belong to **T**; but it does not, so contraposing, the statement that James Bond proved that E = NR does not belong to **T**. Hence also **d** differs from **T**.[2] Thirdly, it is evident on other grounds that there are bound to be exceptions to authors' saysos as to what is true. An author's sayso cannot, for example, guarantee the actual existence of his characters, the flatness of the earth, and so on: the empirical truths of **T** are determined by factors beyond the control of authors.

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[1] The precise nature of structural requirements, like the criteria of organisation that distinguish a good work of fiction, though important, are not a present concern. Forster 49 is a well-known and still valuable discussion of the organisational requirements on a novel, e.g. on plot, theme, character, etc.

[2] Closely allied to the failure of expected inferences when fictional statements are literally true (and thus fail classically expected logical requirements upon **T**), are transparency failures considered below - under the heading 'fictional paradoxes', e.g. the fact that xRa may hold on author sayso but not xRb though a = b.

These sorts of objections destroy the *absolutely naive* theory of fiction according to which whatever an author asserts, especially as regards his characters, is true without qualification, i.e. according to which an author can really ratify whatever he pleases. But, damaging though they are, the objections do not totally demolish modified versions the absolutely naive theory, which can be kept logically alive (just?) by letting $\underline{\underline{T}}$ be sufficiently queer, i.e. by letting $\underline{\underline{T}}$ be radically inconsistent, so that both character x exists (in $\underline{\underline{T}}$) and also x does not exist, and no longer closed under expected entailments. But any such theory would deviate far too far from the controlling intuitive data as to what is true and what is not to be at all acceptable.

If the theory developed in what follows is correct the character of the actual world $\underline{\underline{T}}^{\dagger}$ of the absolutely naive theory, and modifications of the theory away from absolute naiveity, can be worked out. For $\underline{\underline{T}}^{\dagger}$ is just the union of $\underline{\underline{T}}$ with all the worlds of fiction. A first, and *serious*, problem is to argue that $\underline{\underline{T}}^{\dagger}$ is not trivial. This will depend on suitably *restricting* the class $\underline{\underline{N}}$ of works of fiction - something at odds with the main motivation for the absolutely naive theory. For suppose some author of a work asserts: everything is true. On his sayso his work is trivial, and accordingly not of much interest; but if the work belongs to $\underline{\underline{N}}$ then $\underline{\underline{T}}^{\dagger}$ is trivial. Nor it is enough to exclude merely such works from $\underline{\underline{N}}$, to limit authors' sayso only in this sort of respect. $\underline{\underline{N}}$ will have to be restricted to (something like) the class of all actual works of fiction, or the class of all actual works of fiction over all time. For if $\underline{\underline{N}}$ is, as it should be, the class of all works of fiction, actual or not, then as every statement is included in some work of fiction or other - whatever coherence requirements are imposed on a work of fiction - $\underline{\underline{T}}^{\dagger}$ is again trivial.

In sum, the obvious absolutely naive theory has to be rejected; but a modified, and so no longer "naive" theory can be kept alive by restricting the class $\underline{\underline{N}}$ - though there remain major difficulties in so restricting $\underline{\underline{N}}$ in a non-ad-hoc way. And however these are resolved, the modified theory should also be rejected. For it places unwarranted restrictions on an author's freedom to create whatever he will within the bounds of his art. If an author's sayso is a paramount determinant of truth for his worlds, then $\underline{\underline{T}}^{\dagger}$ should be trivial.

Thirdly, as is apparent from the new Bond story, fictional worlds are generally incomplete, seriously incomplete. In the case of Bond's proof details are logically bound to be incomplete or fallacious, assuming that any at all are supplied. The incompleteness of fictional worlds, which more commonly derives from the finitude of books, tapes, and the like, and the limited details they supply and issues they settle, also separates them from the actual world and the usual possible worlds, which are complete: in this respect fictional worlds resemble some of the incomplete worlds of relevant logics.

Just as the worlds of fiction are typically incomplete, sometimes inconsistent, and sometimes physically impossible, so are the objects of these worlds, including the central objects, the characters (in a generous sense), of each N. Physical impossibility is evident from the Faust stories and appears explicitly in much science fiction, e.g. Zap gets into his machine and zooms off at a superluminal speed or into time, in a way defying relativistic laws. Incompleteness and indeterminacy are however more pervasive features of fictional objects than inconsistency of one sort or another. To illustrate the point, Mr. Pickwick is incomplete (indeed ω-incomplete) with respect to stature; for although Mr. Pickwick, as a man, presumably has some height, he is not 5'6" and not 5'7" and not 5'8" and not any other specific height you care to nominate. These is a similar incompleteness as regards other physical characteristics, e.g. girth; for although Mr. Pickwick was a plump man no exact tape measurement specifies his waistline. There are, moreover, logical difficulties in the way of specifying fictional objects so as to ensure completeness of characterisation. Since complete physical objects tend to be infinitely complex, since for example they can be viewed from endlessly many angles at endlessly many times, no finite listing of properties will suffice; only some general recipe can provide a full characterisation. Satisfactory recipes are however not so easily obtained. The apparently simple procedure of comparing a fictional character with an historical person quickly encounters problems. It will not do to say that x is exactly like Winston Churchill, because a fictional character must differ at least in intensional respects, owing to their fictional locale, from historical figures. Nor can x be exactly like Winston Churchill in extensional respects or his exploits could not be separated, he would be extensionally identical with Churchill, and the work would be not fiction but biography. If however it is said that x is (exactly) like Winston Churchill extensionally except in this and that respect, then there are new problems; firstly Churchill's life is bound together in such a way that isolated parts of it are hard to vary without encountering breakdown of lawlike connections; but then, secondly, there is no guarantee that x so described is appropriately complete, that the features he has that differ from those of Churchill are consistently or completely described, since some differences will lead to infinitely many differences (under predicate compounding). Such considerations suggest, but do not show, that complete fictional characterisation is impossible: purely fictional characters can only be more or less rounded out and fully characterised, with matters left open in a way that defeats extensional completeness. And such is one of the assumptions behind the definition of existence provisionally advanced in chapter 1 and 9, according to which an object exists when it is complete and consistent in all extensional respects.[1] If the definition were to stand up,[2] no consistent purely fictional object can be complete, since such fictional objects do not exist.

Thus just as the worlds of a semantical analysis adequate to model the structure of fictional discourse will have to include worlds that are inconsistent, logically and also physically, and worlds that are incomplete (or else somehow simulate such worlds), so the objects of these worlds will have to include objects that are inconsistent and objects that are incomplete, given that the objects have the characteristics ascribed them in the worlds in question.

§2. *Statemental logics of fiction: initial inadequacies in orthodoxy again.* The same considerations which begin to determine the semantics of fiction also help shape the logic of fiction and fictions. In particular, these considerations reveal that the general logic of fictional worlds cannot be classical, and hence that the logic of fiction cannot be modal given that the logic of each world encompassed in modal logic is classical in behaviour, i.e. given that all modal theories are classical. The reason is, once again, that a fictional world may be inconsistent or counterlogical yet nontrivial, in the sense that not everything holds in it; but (as explained in detail in RLR, chapter 1) classical logic trivialises every inconsistent and every counterlogical world.[1]

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[1] Consistency and completeness were assumed to guarantee lawlikeness. For suppose that physical object x violates universal law L, i.e. $\sim L(x)$; but as L is universal it holds for all physical objects, so also $L(x)$. Hence x is not consistent. But the argument is not without its shortcomings.

[2] The limitations of the definition were brought up in chapter 3 and are discussed again in chapter 9.

The logic of fiction differs, of course, from the logic of fictional worlds, much as the logic of modality, which is non-extensional, differs from the logic of modal worlds, of the worlds used in the semantical analysis of modal logic, which logic is essentially classical and extensional, and as relevant logic differs from the logic of the worlds used in its semantical investigation, which worlds are sometimes counterlogical and sometimes inconsistent or incomplete, though relevant logic itself (in main formulations) is none of these things (satisfying the principles of excluded middle and non-contradiction and admitting the rule γ of material detachment). The logic of fictional worlds concerns, in particular, the logical principles that hold for these worlds, especially the closure properties, such as closure under provable logical consequence,[2] which is a requirement on the worlds of relevant and modal logics and is frequently, but erroneously taken for granted in the case of fictional worlds. The logic of fictional worlds is, however, much more anarchical than that of relevant worlds: the logic of a world associated with a work of fiction may be any logic that the author chooses to impose, even none. If an author decides to write an intuitionist or connexivist or nihilist work then he can impose the corresponding logic, and things will occur or be rejected in the world he imagines and describes in accord with the principles of the corresponding logic. Usually, of course, authors do not tax their readers with nonstandard logical, or arithmetic, backdrops (though peculiar geometries are sometimes taken advantage of in science fiction), for obvious reasons - such as lack of author knowledge, reductions in audiences reached when such esoteric tactics are used, etc. Commonly (but not invariably) the background logic is, by default, that of ordinary discourse, and the closure conditions are (as RLR tries to argue) those of relevant logics, e.g. closure under provable entailments, under adjunction, i.e. if A holds in world $\underline{\underline{d}}$ and B does also, then the statement A & B holds in $\underline{\underline{d}}$, etc.

Given that the logic of a fictional world may be any logic, it follows that there is no general uniform logic of fiction. For the intersections of all logics is a null logic, no logic, as each purported logical principle is cancelled out by a logic where it does not hold good. Consider, to illustrate, one of the more promising principles for a logic of fiction, formed by introducing a fictional functor O (Woods' olim operator) read, say, 'it holds in fiction that', namely the principle $O(A \& B) \rightarrow OA$. Spelled out semantically the principle has it that if A & B holds in the world of an arbitrary work N then so does A. But consider now a novel where the principles of connexive logic govern, and where hence A & ~A may hold though A does not. The world of such a novel repudiates O(A & B) → OA. In claiming that there is no uniform logic of fiction, it is not implied that fiction has no logic, far less that is is illogical. In general, each work will have its own internal logic: it is simply that the emerging set of common logical principles will be zero. The semantical structure will reflect this situation.

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[1] Although classically and modally (for normal modal logics) inconsistent and counterlogical worlds coincide, in the wider, and more satisfactory relevant framework they diverge, neither one guaranteeing the other.

[2] That is, if B is a provable logical consequence of set Γ and each element of Γ holds in the world then B also holds in the world.

A logic of area x aims to capture, in a certain recognised and not necessarily complete way, a class of true (usually analytic) statements and valid principles concerning x, characteristically those which formulate the logical axioms, or initial truths, of x and the logical principles of inference that apply within or to x. The claim that there is no uniform logic of fiction is not based on the harsher empiricist view that there are no truths of, or concerning, fiction to capture in a logic, since all direct statements of fiction, such as that Holmes lived in London, are factually false, while covered statements, such as O(Holmes lived in London), are false (or, on a different view, ill-formed) because unintelligible, because they involve an intensional and opaque functor O of which no sense can be made. In short, fiction is illogical because all its statements are false in one way or another.[1] Such a position is hard to sustain; for example, statements such as "Holmes lived in London, according to the works of Conan Doyle" are perfectly intelligible[2] and, so it certainly seems, true. It is less that empiricism makes it difficult to discern any facts in fiction, and so difficult to have any logic of fiction at all, than that the facts of fiction make life decidedly awkward at least for the harsher empiricist positions. Indeed, so the argument will go (in 9.10), the truths of fiction provide yet another set of counterexamples to empiricism; for fiction yields, like theories of nonexistent objects and of intensionality, both truths and knowledge not derived appropriately from experience.

Although there is no uniform logic of fiction there will be an emerging set of logical principles for common works of fiction; it will be, so it will be argued, a kind of relevant logic. It will certainly have to be ultramodal. For simple, and familiar, arguments show the inadequacy of any modal theory or logic of fiction. One argument of a syntactical sort - there are, as we have in effect observed, parallel semantical arguments - takes off from the meaning of 'modal'. A one-place functor C is modal if, and only if, whenever A ≡ B (i.e. A is materially equivalent to B) is a provable classical tautology, C(A) iff C(B), i.e. provable tautological equivalents are everywhere intersubstitutable.[3] According to a modal theory of fiction each statement A of work N is elliptical being, when made syntactically explicit, of the form OA where O [strictly O(N), since O depends on N)] is a modal functor. The argument uses just one other, rather uncontroversial, assumption, that O is &-distributive, i.e. O(A & B) iff OA and OB (or at least one half of this principle, namely if O(A & B) then OA.) If N satisfies A & B then it surely satisfies A and satisfies B, and conversely. In the modal logic of fiction finally arrived at by Woods (74, pp. 141-4), &-distribution is an axiom [namely his (A4)]. Now let N be a work which satisfies a contradiction, say $D \,\&\, {\sim}D$; that is $O(D \,\&\, {\sim}D)$. As Woods explains, the contradiction problem of authored self-contradictions is 'economically' solved within the modal framework by O-covering of the contradiction, i.e. by replacing the contradiction $D \,\&\, {\sim}D$ of N by $O(D \,\&\, {\sim}D)$ (see [74], p.139ff.). Then however N is trivial, N satisfies every assertion, i.e. OC for arbitrary C. The argument is as follows:- As $D \,\&\, {\sim}D \equiv .\ C \,\&\, {\sim}C$ is classical tautology, $O(D \,\&\, {\sim}D)$ iff $O(C \,\&\, {\sim}C)$ by the modality of O. But $O(D \,\&\, {\sim}D)$ by choice of N, hence $O(C \,\&\, {\sim}C)$ whence by &-distribution OC. Thus any work such as N which satisfies a contradiction, or more generally some inconsistency, is trivial; and this constitutes a reduction to absurdity of any claims of a modal theory to adequacy.[1]

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[1] Application of the verification principle, even in some considerably modified forms, will lead to similar results.

[2] Though intensional they even have transparent analogues, as will be seen.

[3] The characterisation extends directly to connectives with several places.

A modal theory of fiction is bound to be unsatisfactory in other respects as well. For example, it is a feature of any modal logic with operator O that if OA is a thesis for some A then, for any tautology B, OB is also a thesis. Since then every work of fiction satisfies some statement, every work of fiction satisfies all classical tautologies! In Woods' modal theory an even stronger principle is adopted, namely $\Box A \supset OA$, whatever is necessary holds in every work of fiction (axiom (A3) of 74 , p.141). Now let N' be a work of science fiction where the point of story turns - through exploitation of incompleteness, obtained for example by setting the story in the world of someone's beliefs, or through use of intuitionistic assumptions - on the rejection of the principle of excluded middle, $C \vee {\sim}C$. In the corresponding logic $O'(C \vee {\sim}C)$ is definitely not wanted, but on any modal logic of fiction the unwanted assertion is automatically forthcoming.

It is a corollary of the inadequacy of modal logics for fiction that no purely classical theory can be adequate either. For any such theory is in effect a modal theory where the modalities collapse: any additional functor admitted, such as O, must meet substitutivity, or extensionality, requirements[2], such as if $A \equiv B$ then $OA \equiv OB$, so ratified contradictions and tautologies inevitably spread in a quite damaging way. A purely classical theory can no more accommodate fiction than it can accommodate intensionality.

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[1] Woods may protest that his 'very weak modal' operator O is not modal (in the sense defined), but the protest rings rather hollow given the claims made in 74, especially p.143, that we require only the classical truth values 'and classical semantical apparatus', that 'we do not need to abandon classical negation' etc. etc. For given classical semantical rules for negation and conjunction at each world - rules admissible for even the weakest modal systems - classical contradictions have the same value, namely O(false), at every world, e.g. if $I(D \,\&\, {\sim}D)(\underline{a}) = 1$ then $I(D)(\underline{a}) = 1 = I({\sim}D)(\underline{a})$, i.e. $I(D)(\underline{a}) \neq I(D)(\underline{a})$ which is impossible, so $I(D \,\&\, {\sim}D)(\underline{a}) = 0 = I(C \,\&\, {\sim}C)(\underline{a})$. Thus classical contradictions cannot be discriminated in any modal worlds, and so $O(D \,\&\, {\sim}D)$ iff $O(C \,\&\, {\sim}C)$ for amy modal operator O.

[2] Wood's quasi-classical satisfaction definition (74, pp.133-4) does not meet these requirements, or, so it appears, modal requirements. From the point of view of designing a satisfactory theory this is all to the good, but unfortunately the rather ad hoc stipulations presented remain too close to the modal for much comfort. For example, on half of the O-clause for material implication ensures that where OA and $A \supset .\ B \supset C$ hold valid then so does $O(B \supset C)$ (p. 135, writing '$\supset$' for Woods' '$\rightarrow$', and making the orthodox connections between universal satisfaction and validity). Consider again a work N which ratifies $D \,\&\, {\sim}D$, i.e. $O(D \,\&\, {\sim}D)$; then $O(B \supset C)$ for arbitrary B and C. N ratifies every material implication, and as a special case every tautology, and, worst of all - upon applying Woods' consistency qualified consequence condition and the fact that ${\sim}C \supset C$ entails C - every consistent statement.

These problems, and others, discerned in modal and classical logics of fiction can be avoided by resorting to a relevant, or ultramodal, logic of fiction. If the modal plan so far being followed, of taking fictional statements as elliptical and as covered, when set out in uncondensed form, by an operator, is carried out systematically the resulting logic will be a multiply intensional relevant logic (of the type studied in RLR, chapters 7 and 8), with one fictional (or olim) functor O_N, or $O(N)$, for each work, or conjunction of works, N. For inclusion of just a single functor O to cope with all fiction (the procedure adopted in Woods [74]) is hardly adequate to the range of fiction to be encompassed, especially when the one character, e.g. Orlando, is assigned quite different properties by different authors.

The common sentential logic of fiction is, the claim is, a relevant logic which contains, as well as familiar sentential connectives, e.g. from the set $\{\rightarrow, \&, \vee, \sim\}$, the O_N connectives. Let O be a representative connective of this type, i.e. $O = O_N$ for some N. O is a systemic connective (in the sense of RLR, chapter 7), that is it conforms to the postulates

R7. Where $A \rightarrow B$ is a theorem, so is $OA \rightarrow OB$

(roughly, fictional worlds are closed under entailment), and

G. $OA \,\&\, OB \rightarrow O(A \,\&\, B)$.

Since $A \,\&\, B \rightarrow A$, by R7, $O(A \,\&\, B) \rightarrow OA$. Thus G can be strengthened to the coentailment $OA \,\&\, OB \leftrightarrow . \; O(A \,\&\, B)$. Several other theorems also follow using the underlying logic of entailment, e.g. $O \sim\sim A \leftrightarrow OA$, $OA \vee OB \rightarrow . \; O(A \vee B)$ (but not conversely). The logic so far presented is a minimal one for systemic connectives: it admits of substantial strengthening without reinstatement of damaging or especially undesirable theorems. For example, various of the schemes Woods has proposed (74, p.141) can be so added, e.g. $OOA \rightarrow OA$ (cf. G8 of RLR), as distinct from $O_M \, O_N \, A \rightarrow O_N \, A$, which is not generally true. Once modal connectives, which are further systemic connectives, are adjoined to the logic other schemes of interest can be investigated, and semantically modelled, e.g. Woods' (A2)$\Diamond (OA \,\&\, \sim A)$, i.e. it is logically possible that fictional work N satisfies A though $\sim A$. Semantics for all these usual logics, both minimal systems (with various entailmental bases) and enlargements of these systems by further connectives and additional axioms, are readily furnished along explored lines (see again RLR, chapter 7). Connective O_N is modelled using an accessibility relation $\underline{\underline{S}}_N$ between worlds. The recursive evaluation rule for O_N is this: $I(O_N A)(\underline{\underline{a}}) = 1$ iff for every world $\underline{\underline{b}}$ such that $\underline{\underline{a}} \; \underline{\underline{S}}_N \; \underline{\underline{b}}$, $I(A)(\underline{\underline{b}}) = 1$, i.e. it takes the form of a modal rule though a much wider class of worlds is considered. The modelling condition for optional extra $OOA \rightarrow OA$, for example, is then: if $\underline{\underline{a}} \; \underline{\underline{S}} \; \underline{\underline{b}}$ then for some situation $\underline{\underline{x}}$ both $\underline{\underline{a}} \; \underline{\underline{S}} \; \underline{\underline{x}}$ and $\underline{\underline{x}} \; \underline{\underline{S}} \; \underline{\underline{b}}$, i.e. there is an intermediary (fictional) situation, precisely as the 'play-within-a-play' phenomena $OOA \rightarrow OA$ acknowledges would lead one to expect.

Just as important as what these logics assert is what they reject, and what they reject the semantics helps disclose. Thus semantical countermodels show that consistency and completeness theses, namely $O \sim A \rightarrow \sim OA$ and $\sim OA \rightarrow O\sim A$, are rejected, just as they can be on modal accounts. More interesting is the way in which the shift to the ultramodal escapes modal difficulties. Firstly, in ultramodal logics (of which relevant logics are a subclass) contradictions do not generally spread or trivialise a theory. In particular, $A \equiv B$ and O_NA do not suffice for O_NB, so the main case made against modal logics fails with ultramodal logics. Secondly, tautologies no longer hold in every world considered, so much principles as $O_N(B \lor \sim B)$ are no longer logically obligatory. Furthermore, a major problem for modal theories, how to amend closure under entailment or logical consequence so as to avert trivialisation of inconsistent stories (a problem explained in Woods 74, pp.50-1, with different equally unsatisfactory resolutions suggested on p.51 and p.133), is automatically avoided by relevant logics which build in paradox-free accounts of entailment, that is accounts where the consequent of any logical consequence connection must be relevant to the antecedents (see e.g. ABE).

Even an ultramodal theory of fiction based on a multiply intensional relevant logic, despite all its advantages, encounters problems if upgraded to the logic of fiction, or acclaimed as a logically comprehensive theory of fiction. As we have noticed, the general semantical framework considered has to be larger than that required simply for relevant logics. For, firstly, works of fiction are not always closed (or intended to be closed) under remote entailment connections. Secondly, a work of fiction can be based upon, or incorporate, a logic (and likewise an arithmetic, a geometry, or a physics) as strange or bizarre or ideosyncratic as the author cares to choose: again, provided the work hangs together appropriately, there are no limits on the organising logic or mathematical theory. The early stories of Borges' (studied in Sturrock 77) and the stories of the Hoyles give some idea of the (almost unlimited) scope available. In principle, works of fiction can be contrived which, like nonnormal worlds, violate each of the closure conditions of relevant logics; for example a work can be designed where $\sim\sim A$ holds when A does not. Such a wider framework is however readily encompassed within universal semantics, and is not uncongenial to more liberal relevant logics which aim to absorb or accommodate their apparent rivals as far as possible (see the strategy of RLR). But no uniform logic remains: how, in that event, can the semantical theory succeed? The beginning of an answer - which will show that no uniform logic is required - lies with (classical) elliptical theories of fiction: but only a small beginning. For a serious trouble, even with the liberal relevant theories considered, derives from the assumption made - the commonplace philosophical assumption - that fictional discourse is properly handled by covering it with intensional functors.

§3. *The main philosophical inheritance: paraphrastic and elliptical theories of fiction.* The main theories of fiction we have inherited are products of the common tradition of empiricism, pragmatism, and more recently classical logic.[1] They are all based on acceptance of the Reference Theory. Accordingly, insofar as they do not try to simply dispense with fiction entirely (a not uncommon philosophical move), they all call for analysis of fictional statements. The favoured method of analysis is linguistic paraphrase.

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[1] Thus theories of and deriving from Bentham, Vaihinger, and especially Russell: Bentham's and Vaihinger's theories have had little direct modern impact. There are of course (sketches of) other theories than those of the main inheritance, e.g. what Meinong had to say in 'Über Urteilsgefühle: was sie sind und was sie nicht sind' in GA I. The theory eventually arrived at in what follows has, as may well be expected, much in common with Meinong's account.

The method, of paraphrase, was clearly stated by Bentham as part of his more comprehensive theory of fictional objects, for example:

> By the word paraphrase may be designated that sort of exposition which may be afforded by transmuting into a proposition, having for its subject some real entity, a proposition which has not for its subject any other than a fictitious entity (Ogden 32, p. 86).

But Bentham did not apply his joint methods of paraphrasis and archetyptation to fictional objects in the modern sense with which we are here concerned, and which coincide in extension with what Bentham called 'fabulous entities'. Rather he distinguished fictions in the logical sense - which are essential for 'the carrying on of human converse' (p.18) and which concern fictitious entities - from fictions in the poetical and political sense - to which attaches 'no coin of necessity' but which serve for amusement or mischievousness and which concern fabulous entities - and applied his methods to logical fiction.[1] Thus Bentham distinguished from

> fictitious entities, which so long as language is in use among human beings, never can be spared, fabulous ... for the designation of the other class of unreal entities (p.17).[2]

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[1] The theory of items advanced in subsequent chapters tends to agree with Bentham's account of what exist, agrees that many objects which do not exist are indispensible for discourse, but disagrees that these objects are fiction, or entities in any ordinary sense, and disagrees on the need for paraphrase.

Virtually all higher order objects which the theory of items admits as values of variables without further ado, are counted by Bentham as fictitious entities, and as such require analysis. For instance, all the objects falling under Aristotle's categories (or Ten Prediciments), except particulars falling under the first head, substance, are, according to Bentham, fictitious entities (p.19).

[2] But elsewhere Bentham gives a different characterisation of fabulous entities, inconsistent with that cited in text, e.g. (p.xxxv, extracted from early work):

> Fabulous entities ... are supposed material objects, of which separate existence is capable of becoming a subject of belief ...,

which rules out, for instance, impossible objects. The characterization given by Bentham's nephew, George Bentham, is even narrower and is radically unsatisfactory:

> III. A fabulous Entity is one which has been believed in by others, but to the existence of which we attach no belief (Ogden 32, p.152).

As examples of fabulous entities, Bentham cited

> Gods of different dynasties; kings such as Brute and Fergus; animals such as dragons and chimaera; countries, such as El Dorado; seas, such as the Straits of Arrain; fountains, such as the fountain of Jouvence (p.xxxvi, note 1).[1]

Bentham's approach - which is worth noting because it strikes a chord with much modern thinking - appears to have been that discourse concerning fictions in the nonlogical sense, about fabulous objects, is simply dispensible, such objects are not required for what counts, scientific discourse or, above all. for the language of physics (cf. Ogden 32, p.xix, lxviii).[2]

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[1] Vaihinger 35 makes a parallel distinction, between scientific fictions, which are equated with fictions simpliciter, 'and the others, the mythological, aesthetic, etc. figments. For instance, Pegasus is a figment, a term, a fiction' (p.81). As in Bentham too, so in Vaihinger, fictions in the sense of fabulous entities or figments, are dismissed as of little or minor importance for a theory of fictions, meaning thereby a theory of scientific fictions.

> ... fictions, such as angels, devils, pixies, spirits, etc., ... are of minor importance for our present theme. At most they concern us only in so far as such a judgment as "matter consists of atoms" or, "the curved line consists of infinitesimals" is to be understood only as a fictive judgement in which no existence is predicated. Otherwise (i.e. if the judgement be not taken to mean that matter is to be regarded as if it consisted of atoms), then a correct fiction is changed into an incorrect judgment, in other words into an error. The primary meaning of fiction = mythological entity, is thus distinguished from the scientific fiction (p.82).

The 'primary meaning of fiction' is precisely that which is of present concern. Subsequently the secondary, philosophical, meaning assigned to 'fiction' by Bentham, Vaihinger, and many others, will be criticised, for it involves a mistaken theory as regards theoretical objects, namely, the position of fictionalism, that such objects are, and function as, fictions.

[2] Similarly in discussing inferential entities, entities which are 'not made known to human beings in general, by the testimony of the senses' (p.8), Bentham remarks (p.10)

> By the learner as well as the teacher of logic, all these subjects of Ontology may, without much detriment, it is believed, to any other useful art, or any other useful sciences, be left in the places in which they are found;

we need 'not trouble ourselves unduly with them' (Ogden's comment, (p.liii).

Dispensible how? As not true, according to Bentham.[1] But the case really relies on a blatant application of the Reference Theory:

> Nothing has no properties. A fictitious entity, being as this name imparts - being, by the very supposition - a mere nothing, cannot of itself have any properties: no proposition by which any property is ascribed to it can, therefore, be, in itself and of itself, a true one ... .[2] (p.86).

This theory has already been examined in detail and found wanting. Most relevant, some statements about fabulous objects are true, beginning with such statements as that they are fabulous and do not exist.[3] Such objects are not nothing (though they are nothing actual), but something; and accordingly they can have, and do have, properties. The correct ascription of these properties to fabulous objects yields true propositions. However truth in Bentham's view can only be obtained by return to the referential mode:

> Whatsoever of truth is capable of belonging to it cannot belong to it in any other character than that of the representative - of the intended and supposed equivalent and adequate succedaneum - of some proposition having for its subject some real entity (p.86 continued).

Although Bentham apparently offers no specific paraphrases of claims concerning fabulous objects, his theory does suggest[1] paraphrases of the sort that were subsequently proposed by Carnap (especially in 37), paraphrases of claims about objects into claims about their names, e.g. of

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[1] Mathematics, which Bentham regarded as concerned purely with fictious entities and as basically 'a species of short-hand', was similarly dispensible:

> otherwise than insofar as it is applicable to physics, Mathematics (except for amusement, as chess if useful) is neither useful nor so much as true (Works, vol. xi, p.72)

Again Bentham's modernity is striking: compare the Quine-Smart position considered in chapter 8.

[2] Monro (67, p.285) concludes, from the assertions he accurately ascribes to Bentham that 'a fiction is nothing; and a quality of fiction equally nothing',

> Thus most of our talk is strictly nonsense, though it can be given a meaning by translating it into terms referring to real entities.

Bentham's text does not in fact, seem to put the points this way, in terms of the Reference Theory of Meaning; and given Bentham's repudiation of the traditional doctrine of terms (e.g. p.lxvii ff.) he may not have been prepared to put the points in terms of meaning.

[3] On Bentham's account, existence is a quality; but as to how this can be so on his account, he owes us a better explanation. He likewise owes us very many specific paraphrases, if the theory is to achieve much of what is acclaimed.

> Fergus is a fabulous entity

into

> 'Fergus' is a fabulous-entity-name.

Such paraphrases have already been considered and found seriously wanting (in chapter 4; the issue is taken up again later in the section).

Vaihinger's account (in 35), sometimes said to have been anticipated by Bentham, is very different, and (once a complicating modality is removed) rather more promising. The basic logical transformation underlying Vaihinger's philosophy of as if consists of the following two elementary stages:

Stage 1. af is transformed to: a must be treated as if it were f. Roughly, af is covered by the functions 'It is necessary to treat things as if'

Stage 2. af is transformed to: a must be treated as it would be treated if (it were) f; i.e. 'as if' is split into its components 'as' and 'if'.

One of Vaihinger's working examples (p.92 ff.) replaced 'Matter consists of atoms' first by 'Matter must be treated as if it consisted of atoms', and secondly by 'Matter must be reated as it would be if it consisted of atoms'. Applied to fictions in the primary sense, this analysis has even less appeal than it has for "scientific fictions". For any figment one cares to consider, it is not necessary (in any good sense) to treat it as if .... We usually do not proceed as if figments existed. But why not delete 'necessary to treat things' from 'It is necessary to treat things as if'. The first stage then simply covers the statement af by the intensional functor 'It is as if'. The second stage, with a little adjustment, takes 'It is as if af' into 'If a were to exist then a would be f'. For example, 'Pegasus is a horse' is transformed to 'It is as if Pegasus is a horse' and so is analysed as 'If Pegasus were to exist then Pegasus would be a horse'. While the intermediary linkages are at best decidedly doubtful,[2] the end connections, which equate an inexistential claim with an intensional conditional, merit consideration. That Pegasus is a horse strictly implies (by a paradox of implications) that if Pegasus exists then Pegasus is a horse, and so presumably yields the subjective restatement. But the converse implication does not hold, even materially. It would require a further antecedent to the effect that if Pegasus does not exist then he is a horse: For what "Pegasus is a horse" says materially is: whether or not Pegasus exists, Pegasus is a horse (by $A \leftrightarrow . B \supset A \text{ v. } {\sim}B \supset A$). Such a method of eliminating the inexistential by way of the intensional accordingly fails.

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[1] In the constant emphasis on names, and the regular insinuations that fictitious entities are really no more than words. Thus, for instance the famous passage:

> To language, then - to language alone - it is, that
> fictitious entities owe their existence; their
> impossible, yet indispensible existence -

to which is appended as a note

> The divisions of entities into real and fictitious
> is more properly the division of names into names
> of real and names of fictitious entities.

[2] Given that Pegasus is a horse, it is not as if Pegasus is [were] a horse. 'It is as if af' tends to suggest, what af does not, that ~af. Conversely, "It is as if af" certainly does not imply af.

Similarly, "It is as if Pegasus is [were] a horse" does not imply "If Pegasus were to exist then Pegasus would be a horse"; nor does the converse implication hold.

The theory that, intellectually at least, superseded Bentham's theory of fiction, Russell's theory of descriptions and of logical constructions, had much in common with Bentham's theory. It is not just that Bentham's referential and empiricist assumptions went over largely intact into Russell's theory; Bentham's 'giving phrase for phrase' in the course of archetyptation is very similar to the method of contextual definition. It is not too inaccurate to say that prevailing theories of fiction (to descent again to the modern nonlogical sense of 'fiction') are, for the most part, variations on or elaborations of Russell's theory. Ryle's account, which will be considered in some detail since it still represents a common position, is such a variation.

Russell's theory of descriptions does not, strictly, determine a theory of fiction, but provides a logical framework for such a theory. Such a theory of fictions is, in a quite precise sense, an *application* of the theory of descriptions. Exactly how the theory of descriptions is applied depends however on whether fictional subjects are treated as primary or secondary occurrences, and on how secondary occurrences are syntactically produced, i.e. what functor is introduced to turn the occurrence into a secondary one. For on the face of it, fictional subjects such as 'Sherlock Holmes' have only one sort of occurrence, a primary occurrence; in sentences like 'Sherlock Holmes is a detective' there is no functor to generate scope ambiguities regarding quantificational analysis of descriptive phrases.

The hardline Russellian approach takes such fictional statements at face value, at least as regards the primeness of the occurrence. On this approach names such as 'Sherlock Holmes' are first replaced - in one of the usual problem-producing ways - by descriptions, and then the theory of descriptions is applied without further preliminary analysis (at least to noncomplex contexts). The result is that all simple fictional claims (e.g. those of the form af where f is classically admitted as a predicate) are false, since existential upon analysis. For af is transformed first to $((\iota x)xg)f$ with $a = (\iota x)xg$, and then to the existential statement $(\exists x)(xg \mathbin{\&} (y)(yg \supset x = y) \mathbin{\&} xf)$. But in fictional cases the latter is invariably false, since fictional characters do not exist. Separate analyses are, of course required to deal with statements such as 'Holmes does not exist (is imaginary, fictional)', etc.

The hardline approach is mistaken for several reasons (most of which have already been discussed); in particular, in intensional contexts not only are there sometimes no descriptive replacements for names, but the theory of descriptions where applied sometimes yield erroneous truth values. But with fictional statements the approach is mistaken even in simple extensional cases, because to assert af is not always to imply, or presuppose, a exists. One who says 'Holmes is a detective' does not imply that Holmes exists, he may be well aware that Holmes does not exist. *Simple fictional statements are commonly not existential statements*.

The latter serious problem is avoided by softer secondary approaches, according to which simple fictional statements, such as af, are really, despite appearance, disguised secondary statements, of the form Φ af where Φ is a (scoping) functor. Secondary approaches are then elliptical theories of fiction, which combine an elliptical thesis with application, as in the hardline approach, of the theory of descriptions. Specifically the analysis proposed is as follows in the case of af:- af, being elliptical for ϕaf, is first expanded to uncondensed form; then ϕaf is transformed to $\phi((\iota x)xg)f$ with $a = (\iota x)xg$; and finally the theory of descriptions is applied, with $(\iota x)xg$ as a secondary occurrence to yield $\Phi(\exists x)(xg \,\&\, (\forall y)(yg \supset x = y) \,\&\, xf)$. The result is not an existential statement because the existential quantifier is covered by ϕ. Elliptical approaches differ as to the construal of ϕ. Does it read 'It is written that' (a construal that fails for unwritten fiction), 'It is told that', 'It is said that', or very differently 'It is pretended that', or does the functor vary from case to case, e.g. from 'Doyle wrote that' to 'Billy Graham intoned that' to 'The Rolling Stones sang that'? There are telling objections to trying to so combine an elliptical theory with the theory of descriptions. Take almost any sentence of the simple form af in the Holmes stories: then while it is true that Doyle wrote af it is false that Doyle wrote the proposed expansion of af. Consider, for example, the (true) statement that Holmes smoked a pipe: Doyle did not write that there existed a unique object with Holmes' properties who smoked a pipe, nor, very likely, would he have been prepared to write such. For Doyle did not believe that Holmes existed or consider himself to be writing a biography. The failure of the more obvious linguistic-style choices of functors to fit the elliptical approaches may help explain the prevalence of such wild theories as the account of fictions in terms of pretence. For something of the sort is hard to avoid on the softer approach. Given prevailing assumptions, the subject a in af must be eliminated even after expansion to ϕaf (unless like Kripke 73 we pretend that a exists), as otherwise there would be truths, of an intensional sort, about what does not exist; and for uniformity of elimination a theory of descriptions should be employed, as for other sentence contexts. The functor must be, it is felt, one of, or appropriate to, fictionalisation; and indeed the functor 'It is fictionalised that, (or less satisfactorily 'Author ... fictionalised that') would give better results than any of the functors that have been proposed for elliptical theories. But theorists would have balked at the verb 'fictionalise' (though its rarity is really a great advantage, e.g. against counter cases drawn from established usage); typically they substituted one of the more familiar verbs dictionaries and thesauri couple with 'fiction', e.g. 'imagine, worse 'feign', or worst still 'pretend'. The intial upshot is appeal to functors of pretence or imagination and corresponding analyses of fictional statements.

However the pretence theory of fiction, the core thesis of which is that fiction is pretence, and an essential feature of which is that many statements of fiction are elliptical and call for expansion to reveal their real logic, may take more sophisticated forms than simple prefixing by the functor 'It is pretended that', 'Author a pretended that' or the like. Pretence theories are to be found in Ryle (see 71, p.63ff), where the theory is backed up by a softer secondary approach, and, in a simpler form independent of secondary approaches, in Kripke 73; pretence theories are also suggested in many other writers, e.g. Smart 77.[1] According to Ryle what an author does is to write sentences which are false but to pretend that they are true. According to Kripke, works of fiction express no propositions, i.e. nothing true or false, by sentences such as 'Mr. Pickwick is plump', although they pretend to do so; 'in talking of Sherlock Holmes and unicorns we only pretend to express propositions' (73, p.8). Ryle even makes the extraordinary claim that Dickens

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[1] For another example - where the pretence theory is coupled with the dubious thesis that 'fictional items are nontemporal' - see Godfrey-Smith 77, p. 394.

> fabricated propositions which were as if they were about a man called Mr. Pickwick, who was testy, benevolent, obese, etc. (71, p.70).

These claims are simply false to the facts. Most authors are not engaged in an elaborate process of pretence. They tell a story; they do not pretend that it is literally true. Dickens did not pretend that Mr. Pickwick was fat or that he existed. On the contrary, authors (like their audiences) are well aware that fictional characters do not exist; recall, for instance, the notices that it used to be common for authors of fiction to insert at the beginning of their works, which implied, among other things, but not always honestly, that none of the characters ever existed. Moreover authors are usually not trying to take in or otherwise dupe their audiences, or to make out that their assertions are referentially loaded. An author such as Tolkein is not trying to simulate reality, he is not pretending to characterise existing creatures. The pretence account goes very wide of the mark when applied to works such as Lord of the Rings. The core thesis of the pretence theory is false: what is right about the thesis that fiction is pretence is that fiction is fiction.

The other part of Ryle's claim, that statements of fiction are uniformly false, will be rejected shortly:[1] but his reason for the claim, that fictional

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[1] Practically all of Ryle's conclusions (71, p.81) concerning imaginary objects should be roundly rejected. Contrary to Ryle (the enumeration corresponds to that of Ryle's conclusions):-

(1) Being imaginary is an attribute (though not a characterising one).
(2) 'Mr. Pickwick is an imaginary, specifically fictional object, and hence Mr. Pickwick' signifies something, namely Mr. Pickwick.
(3) Some of Dickens' propositions are true or false of Mr. Pickwick, but these do not pretend to be true of a Mr. Pickwick.
(4) Propositions from the Pickwick Papers, such as 'Mr. Pickwick dined at Rochester' are about, and are naturally taken to be about, Mr. Pickwick. They are not about the novel in question, and certainly do not assert that the novel contains such statements.
(5) Dickens is not pretending to be characterising Mr. Pickwick; he does characterise him. (But Ryle does claim correctly that Dickens' assertions make sense.)
(6) Imagining is not always imagining that something is the case; one can imagine much else besides, including objects.
(7) Imagining a thing or person is not always imagining that the object has a complex of characters.
(8) In works of fiction characters are originated ('created' in one sense of the word); these objects reduce neither to mere descriptions nor to complexes of properties.
(9) The phrase 'the object or content of an activity of imagining' may be ambiguous, but in one clear sense it can signify an object that does not exist.

(continued on next page)

characters do not exist, so works of fiction are about nothing, can be dismissed immediately, since it is yet another application of the Ontological Assumption (which is also at the back of the pretence pretence) to discourse that is not, and does not purport to be, referential.

The softer secondary approaches are important examples of elliptical theories of fiction according to which assertions of fiction, apparently about fictional objects, are shorthand for statements - characteristically obtained by introducing covering operators which isolate problematic subject terms - statements not about fictional objects at all. But they do not exhaust elliptical theories; rather the secondary approaches introduce problems, through their elimination of names of fictional characters by way of descriptions (or, to put it in the material mode, of fictional objects by way of complexes of properties) that elliptical theories, which do not require removal of names can avoid. For example, much of the trouble with the attempt to explain the apparent truth of "Holmes smoked a pipe" in a secondary way arose from the replacement of 'Holmes' by indefinite description, not, it might well be claimed, by removal of ellipsis.[2] The motivation for elliptical theories is all too evidently referential, but perhaps elliptical theories freed from Russell's theory of descriptions have something else to recommend them, some solid arguments for their expansion proposals. Not only do they not, but there are other things against such theories.

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[1] (continuation from page 22)

(10) The question 'What is the status of Mr. Pickwick?' is a not unreasonable one; it can (especially when 'status' is clarified) be answered, e.g. Mr. Pickwick is a fictional object, a nonexistent but possible object, he has these properties ... .

The case for theses (1)-(10) and against Ryle can be assembled from elsewhere in the text, e.g. (1) is defended in chapter 1, §17. With this material Ryle's arguments, such as they are are, readily demolished. For example, Ryle's defence of (2) depends upon existential-restricted quantifiers, and equating objects with entities. Ryle's arguments for his (3) and (4) (71, pp.68-9) turn upon illicitly writing an existence condition into what counts as aboutness. Moore (59, p.105 ff.) reduces Ryle's conclusion (4) to very small pieces. Ryle's argument for his (6), that one can't strictly imagine imaginary objects, comes down to this (p.72): imaginary objects do not exist so there can be no correlate to imagining them, since one cannot stand in a relation to what does not exist. But of course one can stand in intensional relations to nonentities, and imagining is an intensional connection.

Similarly rejected are Ryle's main theses concerning imagining and allied mental operations such as picturing and fancying that one can sift out of The Concept of Mind. Contrary to Ryle (49, p.245 ff.), these operations have objects, but the objects often do not exist. Thus, for example, when imaging occurs images are seen, when tunes are running in my head tunes are heard (contradicting 49, pp.247-8).

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[2] Again there are trade-offs. If names are not eliminated all the referential difficulties of empty names, beginning with negative existentials, flow in again.

Elliptical theories come in various forms depending on the sort of operators that occur in the expansion. Intensional expansion, where A is replaced by ΦA with Φ an intensional functor, such as 'It is as if' or 'It is pretended that', have already been considered and found unsatisfactory. A further serious problem about the introduction of such functors is that they violate the framework within which elliptical theories are characteristically set; for such functors are highly intensional iterable quantifiable-into operators whose analysis is beyond classical and modal resources (cf. 8.5). Thus a more popular alternative, which avoids the referentially problematic intensional covers, is to take the covering operator as involving quotation, as in translations into the formal mode. Assertions of fiction become assertions about words and sentences, about linguistic entities. So, for instance, 'Pickwick is a fictional object' is construed as short for 'The name 'Pickwick' occurs in some work of fiction', and 'Pickwick was plump' is elliptical for 'One of Dickens' stories contains sentences implying the sentence 'Pickwick was plump'',or some such.[1] What exactly?

Such formal mode elliptical theories have most of the defects (already explained in chapter 4) of theories which would restate theories of objects in the formal mode, in order to avoid violations of the Reference Theory; e.g. the theories (and also most other elliptical theories) are defeated by translation objections, failure-to-generalise objections, and value preservation objections, even modal values not being preserved (consider, e.g. the different effects on consistency of conjoining, sentences like 'Dickens never wrote a story', to 'Pickwick was plump but Disraeli was not' and to its proposed expansion). Stronger connections such as sameness of content or of meaning, are certainly not preserved in any analysis of a fictional statement that introduces information as to the work in which it occurs or as to the author; for someone may understand, e.g. 'Pickwick was plump',without being aware that the source of the assertion was a certain story by Dickens: in short, the analysis conveys different information from what it analyses. It is partly for this reason that elliptical theories cannot do justice to literary criticism and assessment, and to such commonplaces as comparisons of fictional characters from different works or of a fictional person with a real one.

More generally, no purely elliptical theory is faithful to ordinary discourse about fictional objects - which has not been shown to be out of order and in need of such drastic reform. For ordinarily we can say truly, at least sometimes, such things as "Holmes was a detective". But what happens to this statement A on the elliptical theory: it is replaced by another A* (e.g. OA) which is supposed adequately to replace A, and thus be in some sense equivalent to A (or what A was intended to say). What we can say truly with A is said to be properly said with A*. But now what about the original A, which certainly remains in English even if it disappears in canonicalese? A is not meaningless, it passes all the tests for significance (except perhaps, what does not matter, hit-and-run tests, such as those of empirical verifiability). Nor is A true, as follows from the referential assumptions underlying elliptical theories; and if it were true, elliptical transformation of the sort offered would hardly be required. So it is false, which is what Ryle says and what most other elliptical theorists tend to admit at least when pressed - but which is not what we always say ordinarily. And if A is false, then it is not equivalent to A* which is true. Likewise if A is not truth-valued. So the elliptical theory does not provide a satisfactory paraphrase - unless A is in some way ambiguous. But to insist upon ambiguity of fictional statements such as A is again to diverge from what we ordinarily say. On the other hand, something is right (as will become clearer) about the insistence that fictional statements like A are, in the first place, ambiguous, and, in the second, covertly intensional. (Nothing much is right in the attempt to render intensionality quotationally, e.g. by a formal mode recasting.) But what is right about elliptical theories can be better captured by alternative less damaging theories, such as contextual theories.

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[1] An important variant, ostensibly avoiding the serious difficulties of quotation, takes 'Pickwick was plump' into a pair of sentences, e.g. 'Dickens wrote [differently, imagined] that. Pickwick is fat'. This theory, what might be called a Davidsonian theory, will be considered in the next chapter.

The same point applies against partial elliptical theories, i.e. theories according to which not all statements of fiction are elliptical but important classes of such statements are. Kripke's tentative theory of fictional objects appears to be this type. According to this theory, subject-predicate assertions of the form af where a is a fictional object, such as Hamlet, and f a straightforward predicate, such as 'soliloquizes', 'we have to understand ... as prefixed by the phrase "In the story, ..."' (73, p.12). Have to? Hardly; for there are other theories than such an elliptical one; and we can understand af without the prefix. Nor does the prefix help appreciably in this respect; af does not mean 'In the story, af', for all the old familiar reasons; e.g. ~af contradicts af but not 'In the story, af'; af entails a exists according to the Reference Theory but "in the story, af" does not, etc. So as a recommendation as to how to escape some of the puzzles fiction generates for referential philosophies (such as Kripke's, see §14), the prefixing proposal has its limitations; it reintroduces leading problems of elliptical theories. Kripke proposes to avoid some of the worst of these problems[1] - counterexamples deriving from apparently true statements about fictional objects outside the scope of their source stories, e.g. 'Hamlet is a fictional character who wanted to avenge the murder of his father'. 'There are thousands of fictional characters who have fallen in love' 'This literary critic admires Desdemona' - by reserving prefixing for certain usages only, and by adopting what might be dubbed a multiple usage doctrine.[1]

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[1] Kripke's claim that 'fiction is no problem for any theory' of denotation or naming (73, p.3) is perhaps surpassed only by Dummett's deliberately provocative claim (already noted in 1.14) that 'there is no alternative theory of proper names that can be opposed to Frege's theory' (73, p.146, p.143). Of course both have reasons, bad reasons, for their extravagant claims. Kripke's claim depends on taking for granted a pretence theory of fictions, Dummett's on characterising what a theory of proper names is supposed to do in self-validating Fregean terms. Kripke's argument for his claim is simply that on any theory 'it will be part of the pretence of the fiction that the narrator stands in the correct relation to a definite object, and that the appropriate conditions of naming have been met' (73, p.3), correctness and appropriateness being determined by the theory. That is, the "no problem" claim depends on the correctness of, what is itself problematic, a pretence theory! This point could (at first sight) be evaded by a fictional theory of fiction, by making it part of (the fiction of) the fiction that ... things are referentially well-behaved. But the trouble Kripke gets into on something as simple as negative existentials concerning fictional objects give the lie to his claim.

Postcript: It is not difficult to unearth claims that vie with Dummett's! One example is Putnam's contention that there are no 'longer any philosophical problems about Time' (67, p. 247).

Kripke distinguishes at least these (none too sharply characterised or separated) usages:-

1. 'A rather special usage, in which one just reports on the story'. Here "Hamlet exists" is (alleged to be) true. So presumably is "Hamlet thinks" and "Sherlock Holmes is fit". The philosophically interesting example is Hintikka's 'Hamlet thinks, so, Hamlet exists' which Kripke says we must understand as 'In the story, Hamlet thinks; so, in the story Hamlet exists'. Again we don't have to; indeed this is a most peculiar way to construe the argument.

2. The usage 'in which one speaks on the level of reality out and out. Here "Hamlets exists" is false'. So presumably is "Hamlet thinks" and "Sherlock Holmes is fit".

3. The 'fictional character' usage, where fictional characters 'are abstract objects, but as real as everything else'. In this usage,'"Hamlet exists" is true'. So presumably are all story-guaranteed ascriptions to those newly located abstract entities, e.g. "Hamlet thinks", "Pickwick is fat".

This is all pretty implausible;[2] such a statement as 'Hamlet exists' is not three ways ambiguous. Nothing of course prevents the introduction of new senses for 'Hamlet exists', or stops Kripke discerning an abstract object which he can call 'Hamlet' if he chooses. That does not show that the object discerned exists, or that it has the ascribed properties, e.g. that it has much to do with Hamlet. In fact Kripke tells us very little about his abstract objects and what properties they have; the only detail given of how the abstraction is effected is the following puzzling remark:

> "Hamlet" is introduced first as a pretended ordinary person: then we move to infer the existence of a pretence - of the fictional character (p.14).

Enough is revealed however to make it plain that the abstract fictional entities differ from corresponding fictional objects, that the abstract entity Hamlet is quite different from Hamlet. For instance, Hamlet is abstract (a pretence, etc.), Hamlet is a particular (a prince, etc.); Hamlet exists (or at least is supposed to) Hamlet does not (and is not usually supposed to); Shakespeare wrote about (actors study, etc.) Hamlet not Hamlet; Kripke introduced us to Hamlet, not Hamlet; and so on. But in a very audacious stroke Kripke claims that ordinary language has an ontology of such abstract entities (p.13, p.14, p.15). The claim is false and without foundation; nor does Kripke try to substantiate it. There is ordinary language discourse about Hamlet - but Hamlet does not exist, and so is not part of the corresponding ontology. There is no such discourse about Hamlet: it is false that 'an ontology of fictional characters [is] ... just a feature of ordinary language' (p.13). It is not difficult to see why Kripke would think that it was, as he puts it must be, a feature of ordinary language ontology. The obvious, and natural, way to account for true statements apparently about fictional objects which cannot be set down as internal to their stories, is to allow that they are about what they appear to be about, fictional objects. But then, by the Ontological Assumption, they must exist. No such particulars exist, so they must be abstract objects. Moreover what exists must be the very objects "recognised" by ordinary language. This is essential in reaching (by illegitimately transferring the apparatus of referential logic to what does not exist) supposed counterexamples to the theory (given under head (1)), such as 'This literary critic admires Desdemona'. Were the theory to supply only Desdemona such counterexamples would stand: the critic was not admiring Desdemona, such an abstract structure being no substitute for Desdemona.

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[1] The doctrine has much in common, both in its referential motivation, and in its results, with Waismann's multi-strata account of language: see Waismann e.g. 68.

[2] But worse is to follow: Even when the alleged ambiguities are resolved the forms cannot be taken at face value, as otherwise propositions would be expressed, since each of (1)-(3) yield true or false statements. This would contradict Kripke's general thesis that fictional sentences do not express propositions but just pretend to. Kripke tries to solve the problem only in case (2); and there the proposal, a direct application of the Ontological Assumption, is, as we saw in 1.14, unsatisfactory. A coherent version of Kripke's baroque theory has yet, it seems, to be presented.

§4. *Redesigning elliptical theories, as contextual theories.* It is often quite unclear, especially in discussions which compare fictional characters, e.g. a as a general with b as a general, what the covering functor elliptical theories lead us to expect is or how it is determined. It is, in fact, unclear in many cases that there is an implicit covering functor, covering apparent truths of fiction or that what is implied thereby holds good, namely that a fictional statement A is ambiguous as between A and $O_N A$ where O_N is the functor supplied by its source N.

Something like ambiguity in many statements of fiction - by no means all - is forced by any theory which allows work of fiction N to ratify statements as true, which incorporates a (qualified) sayso condition of truth (to adopt again Woods' illuminating terminology and explanation; see 74, p.35 ff., p.133 ff.). Although something like ambiguity is forced, nothing like the ambiguity Kripke discerns is so justified. What has to be taken account of are circumstances like the following, where a fictional object is physically related to an entity:- The statement that Holmes lived in London (hil, for 'Holmes lived in (or inhabited) London' with the predicate infixed, for short) is true, by the author's sayso; but the statement is also, in referential settings, false. For Holmes did not live in London,[1] as empirical scanning would have revealed: a stake-out on Baker St. would have obtained no trace of Holmes, none of the numerous comings and goings said to have occurred there would have been observed. Holmes was not, that is, an historical figure, as we can now convince ourselves in other ways, e.g. there is no record of him in the British registers for births and deaths, even his address was fictitious as a visit to Baker St. will disclose. Thus London was not where Holmes actually lived: indeed since Holmes did not exist, was a merely fictitious person, Holmes could have lived nowhere actual, it may be said with some feeling.

The consistency (or Brentano) problem[2] for any fictional statement which appears to concern, or relate to, an actual or historical object - e.g. is about Richard III, or relates Holmes to the entity London - arises (so several investigators have observed, e.g. Woods 74, p.129, Devine 74, p.393) from rival truth standards, or, to put it more fashionably, from rival and conflicting, truth definitions. According to one standard, the sayso condition, hil is true, according to another, that of history or, more generally, of empirical fact, hil is false. It has been taken as evident that there can be no consistent combining of the results of applying the different standards in the one world (or theory) $\underline{T}$, representing the class of truths, without the insertion of some differentiating factor which distinguishes the cases. This factor has been assumed to be ambiguity. Thus Devine (74, p.395):[1]

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[1] In terms of the distinctions of 1.21 - to indicate the direction of travel - 'Holmes lived in London' is true, since the relation is reduced; but in a referential context, where the relation is entire, the statement is false.

[2] At least this is a problem if we (correctly) put aside any dialectical grasping of the nettle of more naive theories which accept without qualification both hil and ~hil.

> 'Richard III killed the princes' is ambiguous: it may be taken as a statement of historical fact (in which case it had been doubted), or as a statement of what goes on in Shakespeare's play (in which case it cannot be) ... [because] it is true according to another standard of truth, fidelity to Shakespeare's play 'Richard III'.

Woods makes a similar assumption, and goes on to propose, after some argument that is worth returning to, that the ambiguity of troublesome fictional sentences be resolved by representing each such sentence A by a pair of sentences <A, OA>. That is, the sentence A of English may mean either A or OA (at least in the logical language where the formal logic of fiction is developed). However there are grounds for unease about each of the shifts made beyond the location of an ambiguity, and especially about the claim to ambiguity.

For 'Holmes lived in London' does not appear to be ambiguous in the sense of having more than one sense, and there do not appear to be any structural features which would account for the alleged ambiguity. For consider the parts: 'lived in' does not exhibit any relevant ambiguity; and, as Woods remarks (p.131) 'it just not seem that'Holmes' is ambiguous', and similarly it seems for the term 'London'. Nonetheless <u>every</u> ambiguity that <u>could</u> be ascribed to hil (in virtue of its logical form) has been ascribed to it. Thus it has been variously suggested not just that 'Holmes' is ambiguous (cf. Kripke above) or that 'London' is ambiguous and should be replaced by 'the London of the Holmes' stories' or some such duplicate term (cf. Devine), but that 'lived in' is ambiguous as between various modes of predication (cf. Castañeda 79) or that 'lived in London' (and likewise 'Holmes lived in') is ambiguous. On Parsons' distinctive theory of fiction (74 and elsewhere), 'lived in London' <u>is</u> ambiguous; 'Holmes lived in London' is ambiguous as between 'Holmes [lived in London]' (with 'Holmes' as subject and 'lived-in-London' as one-place predicate) and '[Holmes lived in] London & Holmes [lived in London]' (which is identified with 'Holmes lived in London'), according as the two-place predicate 'lived in' is "plugged up" on the right or on both the left and the right to yield one-place predicates. The intuitive base of Parsons' proposal, however, undoubtedly has considerable appeal - in this sort of case,[2] and before one encounters the gory logical details of the cut-and-plug theory of relations - and something rather like it will ultimately be fallen back upon. For there is a rather natural temptation (encountered among the philosophically uncorrupted) to say both that it's true of Holmes that he lived in London and that it's not true of London that Holmes lived there. But the temptation can be accounted for in other ways than Parsons' theory (as will emerge); and there is unfortunately some temptation among some people to say that inasmuch as it's not true that London was not lived in by Holmes, it's not true that Holmes lived in London. What there isn't the same temptation to say is that the English sentence 'Holmes lived in London' is misleading as to logical form, that it resolves under logical rendition into two different syntactical forms at least one of which does not (really) occur in English. The statement hil is not ambiguous: that is a guiding principle that will be adopted and defended in what follows:

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[1] Devine, despite the title of his paper 74, offers us no logic of fiction in the modern symbolic sense: there is no formal logic, no syntax, no semantics. Worse, how such a logic would look is left quite obscure. The same criticism applies to many other writers on the "logic" of fiction.

[2] The case, that is, of physical relations between fictional objects and entities, <u>not</u> other cases where the relations are not physical (or extensional) or relate entities and entities or ideal objects and entities or nonentities with nonentities.

If there is no ambiguity of sense or meaning, of the sort disclosed by Castañeda's or Parsons' or Woods' representations, what is the justification for them; for instance, what is the excuse for sometimes replacing A by OA? This seems even less excusable when it is realised that the replacement differs in meaning from what it replaces; for example, 'Holmes lived in London' is not synonymous with 'O (Holmes lived in London)', as elementary translation tests, among others, reveal. If 'Holmes lived in London' were translated into another language in the form 'O (Holmes lived in London)', or vice versa, the translation would be considered incorrect, a mistranslation. Embedding tests for synonymy, for what they are worth, yield the same results; when a recalls hil he is not recalling Ohil, when he asserts or assents to Ohil he is not asserting or assenting to hil, etc. (Rather similarly, though less obviously because of the unfamiliarity of Parson abstracts, when hil is replaced by h[il].) Furthermore OOhil and Ohil are not equivalent (according to Woods 74, pp.141-2), as would commonly be expected were the synonymy claim correct; or, in less questionable terms, Ohil and hil are not synonymous because what implies them and what they imply differ. Any elliptical theory (which genuinely shields fictional statements from reality) is going to be open to similar objections from meaning change. Fictional discourse contrasts with literal reportative discourse (as Woods explains, p.26), but the elliptical theory would have it replaced, according to the empiricist paradigm, by what it is not, discourse reporting facts - in this case about what author wrote or asserted what.

There are still other difficulties with any elliptical theory, some of which transfer to most theories alleging syntactical or semantical ambiguity. For non-negligible portions of typical works of fiction are entirely true (as Urmson has argued, 76, pp.153-5): the truths include sociological generalisations, presupposed truths such as that men have such and such physiology, wants and drives, historical and factual information, and background truths of geographical, historical and social setting, often required to make a work comprehensible. (Such truths belong to the source book for the work in question.) Yet such truths require no cover (as an elliptical theory may try to acknowledge by admitting that for such A, OA $\equiv$ A). There are accordingly problems as to how to separate such statements not requiring cover from 'the essentially fictional statements' of fiction which on elliptical theory do require cover, and as to how to preserve this isolation, since ordinarily statements of the two sorts can be combined, inferentially-linked, and otherwise interrelated (consider, e.g., the trouble Urmson finds himself in, 76, p.157, as regards the interpretation, and truth-functional coupling, of truths from fiction with essentially fictional statements, which on his, hardly convincing, account are neither true nor false).

To deny that fictional statement A is synonymous with nonfictional statement OA, to contend that asserting A is not the same as asserting OA, is not however to deny that there are important logical linkages between them. The linkage is this: the semantical assessments of A and OA often reduce to the same thing. Although such an admission may suggest to the positivistically inclined that the sameness of meaning of A and OA has now, inconsistently, been conceded - after all the sameness of verification (albeit in a wide sense) has been admitted - examples of the following sort should help bring out the requisite differences:- The semantical evaluation of 'I am hot', as said by RR, comes down to the evaluation of 'RR is hot', since the speaker is RR, but the two sentences do not mean the same. The sentences in their respective contexts have the same semantical content in that, once context is taken up in the course of semantical evaluation, the semantical assessment is the same. For example, $I(Ohil)(\underline{\underline{T}})(s) = I(hil)(\underline{\underline{T}})(c)$, where s is a standard context and c is an appropriate fictional context.

There is no riddle, then, on the contextual theory, as to how the consistency problem for statements such as "Holmes lived in London" is to be resolved without resort to ambiguity in the more ordinary sense: the missing factor, which makes the difference, is context. "Holmes lived in London" is true in one context, c say, and not true in another, a referential context s say. Thus, in the symbolism of the universal semantics of 1.24, $I(hil)(\underline{\underline{T}})(c) = 1 \neq I(hil)(\underline{\underline{T}})(s)$; there is no inconsistency because c differs from s. The resolution of the contradiction problem is precisely that already proposed in Slog (p.469, with symbolism adjusted to conform with 1.24):

> ... context-situations [i.e. the pairs formed by taking contexts together with worlds] enable the semantical assessment, but without the usual distortions, of confident truth-claims such as "Sherlock Holmes lived at 221B Baker St." ($\underline{p}_0$) said - to supply part of the context c for the assertion $\underline{p}_0$ - in answer to the question "Where did Sherlock Holmes live?" This claim is true, in its context, even though it clashes with other factual information we have about Baker St.; yet it is not equivalent to the claim "It is written in Conan Doyle's novels that Sherlock Holmes lives at 221B Baker St.". Such claims as $\underline{p}_0$ can however be construed as involving a shift of the base situation with respect to which truth assessment is made, from the usual $\underline{\underline{T}}$ to a new situation $\underline{\underline{a}}$, determined by c, i.e. $\underline{\underline{a}}_1 = f(\underline{\underline{T}}, c)$ [and from c to a new context $s = g(c)$]: roughly $\underline{\underline{a}}_1$ is the situational closure of the world selected by the "it is asserted in Conan Doyle, or Sherlock Holmes', detective novels that". Then $I(\underline{p}_0)(\underline{\underline{T}})(c) = 1$ because $I(\underline{p}_0)(\underline{\underline{a}}_1)(s) = 1$, i.e. because according to the novels Holmes did live at that address; and this claim is not undermined by objections such as "221 Baker St. was not a residential site" ($\underline{q}_0$) because the context of $\underline{q}_0$' does not shift the base situation $\underline{\underline{T}}$. How does one tell when the base is shifted? A non-trivial answer is: the context supplies a base-shifting function, and this figures as part of the modelling. For example, the modelling can, under this extension, associate with each [context-situation $(\underline{\underline{a}}, \theta)$ a transfer function $\delta = (\theta_b, \kappa)$ where θ_b is] a base-shifting function θ_b from context-situations to situations such that $\theta_b{}^2 = \theta_b$, normally a projection function which makes no shift [and κ is a context-changing function]. Then where part of the context sets the sentence in another context-situation, $I(A)(\underline{\underline{a}})(\theta) = 1$ iff $I(A)(\underline{\theta_b}(\underline{\underline{a}}, \theta))(\kappa(\underline{\underline{a}}, \theta)) = 1$.[1]

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[1] (Footnote on next page.)

The contextual theory alone undercuts the 'general lesson' supposed to be learnt from Urmson's account (76, p.157), the (alleged) inadequacy of logical theories of fiction:

> There are those who assert that sentences are the bearers of truth or falsity, whereas ... the writer of fiction as such asserts nothing true or false though he employs sentences indistinguishable from those used by those who do. I cannot see how such a sentence, however reformulated in logician's language, could be essentially fictional or non-fictional.

The semantical (meta-)language need only include contextual indicators for requisite distinctions to be made.[1] Parsons' theory does more: it reveals how the logical forms of a sentence could show (though in an artificial fashion) whether a sentence was essentially fictional or not.

The contextual theory enables a great many of the commonsense claims that are made regarding fiction and fictions to be made good - many but by no means enough.

§5. *Elaborating contextual, and naive, theories to meet objections; and rejection of pure contextual theories.* As Woods has truly said, then, 'much of what is distinctive about fictional discourse is ... the distinctive context in which it may be supposed to be embedded' (74, p.12). Woods also found a key to the semantical analysis of fictional statements, namely that

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[1] (Footnote from previous page.)

A parallel contextual analysis applies also to non-literary fictions; it takes up familiar, more intuitive, assessments such as the following:

> ... when something is said to be a legal fiction, it is sometimes meant that while it is held to be true in courts of law, it is in fact false (Urmson 76, p.153).

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[1] For a beginning on locating what is wrong with the Strawson-Urmson thesis that 'the essentially fictional assertions in works of fiction are neither true nor false', see Blocker 74. It is worth noting that neither of the analogies on which Urmson's case depends stand up to much examination, and that Urmson has to engage in a certain amount of what looks remarkably like double talk, e.g. (76, p.156):

> ... though I can claim philosophically 'that Persuasion begins with no assertion about anything, one can appropriately say that the opening sentence is about Sir Walter Elliot. No more puzzling is the fact that if I ... say that Sir Walter Elliot read nothing except the Baronetage, it will be a true statement verifiable by reading Persuasion, whereas the first sentence of Persuasion, which runs: "Sir Walter Elliot ... never took up any book but the Baronetage", says nothing true or false (emphasis added).

The "philosophical claim" is squarely based, like the Strawson-Urmson thesis, on the Ontological Assumption.

fictional contexts transfer the base world where truth is assessed from the real world $\underline{\underline{T}}$ to fictional worlds:

> ... mythological statements resemble fictional statements at least insofar as neither kind is thought, by those who recognise them to be mythological or fictional, to describe the real world (74, p.30).

But though Woods dallys with the contextual approach (see especially 74, p.117-9, p.131) he eventually rejects it. If the contextual theory of fictions outlined is to stand, it will have to be able to meet such objections as those Woods and others level.

One objection is that the contextual theory still treats fictional claims as ambiguous; it merely relocates the ambiguity, as in the context. If 'ambiguity' is stretched in this way, beyond its dictionary senses (such as 'double meaning'), if one insists upon calling different contextual resolutions those of ambiguity, then of course the theory is a further "ambiguity" position - any position which resolves the inconsistencies is. So is any statement involving "egocentric" particulars; e.g. 'I am hot' is (potentially) infinitely ambiguous! But if due account is taken of what ambiguity is like, if different senses are required for ambiguity, then the contextual theory is very different from an ambiguity position.

Another objection relies on the shaky distinction between semantics and pragmatics.

> To demand that considerations of structure give way to the pragmatic ones of context and use is tantamount to abandoning a semantics for fictionality (74, p.131).

It is true that calling the contextual theory of fictions outlined a 'semantical theory' violates the letter of the received semantics/pragmatics distinction of Morris and Carnap, since contexts (of use) are invoked. Within the confines of the received distinction,the contextual theory proposed, like much else in semantics, really belongs to a part of pragmatics; and if the theory were reclassified, say as a pragmatico-semantical theory, there would not be much point in lodging an objection. But even the received distinction allows semantics to step beyond "considerations of structure". Moreover the received distinction was too narrowly conceived to account for what it was supposed to account for, namely meaning. In order to account for intensional discourse satisfactorily, world relativisation (or an equivalent) of the relations that were taken to be fundamental in semantics, such as truth, satisfaction and designation, has to be admitted, and has been admitted in more liberal quarters. Such world relativisation is, however, much like context relativisation, and can indeed include it (see Slog, pp.466-8). In fact relativisation with features in common with that required for context is already allowed in received semantics, namely relativisation to a given language. In short, enlargement of what counts as semantics over the received empiricist account is essential if the meaning of much significant discourse is to be accounted for, if the objectives of semantics are to be accomplished, but the enlargement already provides apparatus like or including that employed in contextual analysis. More than this, the semantical apparatus has to include such contextual relativisation if the meaning of tensed expressions and of such particulars as 'I', 'now', 'this' and 'that' are to be accounted for satisfactorily. That is, an adequate semantical theory has, to account for significant parts of discourse, to encroach upon what used to be reckoned pragmatics; and the semantics of fiction scarcely encroaches more. The received distinction has, accordingly, to be scrapped.

The scrapping of this distinction is not the only, or worst, trouble that the contextual theory leads us into. The move of taking fictional statements at their face value, as naive views do, and as not analysed away or at least shielded by operators, and thereby quarantined, gets us into big trouble once again with powerful referential interests. For removing the covering is tantamount to allowing that some fictional statements are true and that some fictional objects have genuine properties, and thus to moving back towards more naive theories of fictions, incompatible with assumptions of the Reference Theory and the positions it underpins such as empiricism.

The contextual theory of fiction does enable us, however, to approximate closely naive accounts of fiction and to absorb other theories of fiction, such as the dimensional theory, which cope rather more successfully with the preanalytic data[1] than empiricist moves can do. According to the dimensional theory, which introduces the notion of linguistic dimension to solve such problems as the contradiction problem, 'Holmes lived in London' is true in one dimension, e.g. the 'language of fiction', and false in another, e.g. the 'language of reality' (cf. Woods 74, pp.117-9, where this popular theory is sketched and dismissed). To take up the theory simply replace 'dimension' by 'context'. Aren't our sayings as dark then as those as Woods has said those of the dimensional theory are? No, because the notion of context has received a good deal of explanation in the semantical literature, though, needless to say, opponents of its adoption are far from satisfied.[2] What of the problems Woods sets for the dimensional theory? Suppose, to begin on the first, N_1 ratifies $\underline{p}_1$ and ratifies $\underline{p}_2$. Then $I(\underline{p}_1)(\underline{\underline{T}})(\underline{c}(N_1)) = 1 = I(p_2)(\underline{\underline{T}})(\underline{c}(N_2))$, where $\underline{c}(N_1)$ is a requisite context of N_1. But what of logical compounds such as $\underline{p}_1$ & $\underline{p}_2$, especially where $\underline{p}_1$ and $\underline{p}_2$ are inconsistent? Suppose N_1 does not rafify $\underline{p}_2$, i.e. $\underline{p}_2$ is not entailed by anything N_1 ratifies, so $I(\underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1)) \neq 1$. Since $I(\underline{p}_1 \,\&\, \underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1)) = 1$ iff $I(\underline{p}_1)(\underline{\underline{T}})(\underline{c}(N_1)) = 1$ and $I(\underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1)) = 1$, $I(\underline{p}_1 \,\&\, \underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1)) \neq 1$. If however N_1 does ratify $\underline{p}_2$, then $I(\underline{p}_1 \,\&\, \underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1)) = 1$; that is, an inconsistency is true in the context of $c(N_1)$. But what of combined contexts? Let $\underline{c}(N_1$ and $N_2)$ be a context generated by N_1 together with N_2; it will ratify whatever either N_1 or N_2 ratifies, so $I(\underline{p}_1 \,\&\, \underline{p}_2)(\underline{\underline{T}})(\underline{c}(N_1$ and $N_2)) = 1$. Such combined contexts, usually obtained by closure of the union of contexts, are important in accounting for literary comparisons, e.g. 'Holmes was a detective but Hamlet wasn't', 'Holmes was a better strategist than Hamlet', etc., and in meeting Woods' objection that no room is left for literary criticism, even for such platitudes as 'Holmes was a very different sort of strategist from Hamlet'. Nor is there anything preventing such combined contexts taking in also sizable slabs of factual material, thus enabling the assessment of such comparisons as 'Hamlet was a smarter stateman than Eisenhower'. Such comparisons raise problems not intrinsically more difficult than comparisons of historical figures from different times, as for instance in 'Jefferson was a smarter statesman than Eisenhower'. Temporarily provides, as often, a good working model for contextuality. However the way these comparisons are made is not nearly as clear as it might be (and as it is in the integrated theory).

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[1] It will be complained that many questions have been begged by taking so many fictional statements as true - statements empiricist and reductionist theories would deny. In what follows an attempt will be made to meet some of the complaints that emerge. But there is indeed a problem of data.

[2] For example, Kripke 73 pooh-poohs use of context dependence and contextual restrictions, but on feeble Quinean grounds, e.g. 'how are contexts individuated?'.

There are, of course, sometimes problems as to which context one is operating in. One can be confused as to what the context is, e.g. as to which work a given character appears in, not knowing what the context is, or be entirely mistaken as to what it is. Such indeed provides part of the evidence for the contextual theory. There is much circumstantial evidence of this sort supporting the contextual account of fiction. For example, there is the experience of not knowing the context, familiar to people who have not read a book, been to a film, or seen a television show, that is under discussion. Such people are left out of discussions by not knowing enough of the context: they cannot play the fictional game properly, a little like someone who does not know a language well. Another piece of evidence comes from the placement and settlement of bets concerning fiction, e.g. as to which street Holmes lived in (cf. Woods' discussion of the bet sensitivity of fiction in 74). There is also evidence that ordinarily something like transfer is used in avoiding clashes. For instance, J says that Holmes who existed last century lived in Baker St., for instance in answer to a question. K objects that Holmes did not live in London at all and did not in fact exist. J explains that he was talking about a character in stories and that what he said was not intended to hold for the narrow world of fact.

Part of the evidence for the contextual theory of fiction, that is, is the coherent way it enables us to account for much of what we say, and do, as regards fiction, and part of the evidence, the same evidence, is the way the contextual theory enables us to reinstate the ordinary naive theory of fictions. The ordinary naive theory (which contrasts with the absolutely naive theory) includes, according to Woods, the following theses (see the discussion in 74), chapter 2, especially pp.30-1):

(1) Purely fictional items, such as Holmes, do not exist, and never have; they are unreal, do not come into existence, are causally unrelated to actual objects - and similarly for a batch of properties linked with (real) existence.

(2) Notwithstanding (1), what an author ratifies, for example in the way of ordinary features for his characters, holds.

Thus in particular, Sherlock Holmes was male, British, a detective who resided in Baker St., London. He was also both a minded object, capable of action, passion and thought, and a concrete spatio-temporal object, having a body of more or less determinate proportions, a series of sometimes discontinuous geographical locations, a more or less specific temporal history, and so on.

> ... Holmes is a man (or was), and he did live in London, and does not exist and never did. Such ... is the heart of the naive theory of fictionality (74, p.28; cf. also p.31).

Note that from (1) and (2) a version of Meinong's Independence Principle follows, namely that a fictional item has properties does not imply it exists (or has existed). This suggests that we do, what the contextual theory has thus far signally failed to do, invoke the full theory of items and treat fictional characters as what they are, objects with this-worldly features as the naive theory would have it, not merely with other-worldly features. This is the route to the integrated theory which combines the contextual theory with the theory of objects.

There are several logically important special cases of (2), some of which we have already exploited, which hold on the naive theory:-

(2.1) Fictional objects have a wide range of ordinary (and extra-ordinary) properties, e.g. Holmes has or had the property of being a man, i.e. Holmes was a man, Frodo is a hobbit, Gandalf a wizard, and so on.

Exactly which sorts of properties fictional objects have and can have, however, and which (such presumably as existence) are excluded, the naive theory makes none too clear: taking up the matter leads to more sophisticated theories.

(2.2) Identity, difference and numerical statements hold regarding fictional objects, e.g. Holmes is identical with a certain detective who lived in London, Holmes is distinct from Frodo, and Holmes, Lear, and Gandalf are three.

These sorts of truths, in particular, set the ordinary naive theory severely at odds with conventional logical wisdom, e.g. with mainstream theories of quantification, descriptions and proper names.

(2.3) An author may ratify inconsistency and incompleteness, and departures from logical laws or physical laws.

The problem for any reinstatement, or reconstruction, of the ordinary naive view is how all these things can be true, how (1) and all the parts of (2) can hold simultaneously. The contextual account ensures - or claims to ensure - all this, and perhaps consistency as well, by relativising (1) and (2) to different contexts. An author is not an authority on the actual empirical world (on $\underline{\underline{G}}$) and not all he says holds for that, and there what he says (e.g. on radio interviews, and in newspapers, of the world) must take its chance and be tested against what does hold as a matter of fact; but within limits he is an authority on the worlds of his imagination and what he ratifies goes for the worlds of his fiction.

It is a legitimate objection, however, that the contextual theory has so far avoided various important questions to which answers are needed in any logical elaboration of the ordinary theory, questions such as: What properties, other than derivative ones like nonexistence, purely fictional objects do have in respect of standard nonfictional contexts? How does fiction relate to reality, by what sort of relations? Unique answers to these questions are hardly to be expected: differently elaborated contextual theories will give different answers.

The ordinary naive theory - at least as so far presented - is deliberately unspecific as to whether authors' ratifications clash with empirical data, e.g. Holmes' living in London with his not living in London, and how, if so, clashes are resolved, if and when they are. It is worth distinguishing various ways of sophisticating the naive theory to cope with this recurring problem. The main options investigated, and not so far completely failed, fall under the following head (all options are considered in §7):

(PC) Pure contextual (no clash) theories. According to these, context always serves to prevent clashes: authors' ratifications are only good for fictional contexts, never for what might be called empirical or "everyday" ones (but are really referential ones). Thus these theories can add to theses (1) and (2) the following thesis:-

(3) Notwithstanding (1) and (2), fictional truths can be incorporated consistently into the body of ordinary truths (and fictional propositions into the body of ordinary thought).

It may be questioned whether (3) is part of the ordinary theory since it is, on modern conceptions, a meta-statement. However (3) is, it may be contended, part of what is ordinarily believed and assumed, and so is part of the ordinary theory (to the extent that there is an ordinary, but not clearly articulated, theory or set of assumptions). This claim is by no means evident: it is far from as clearcut as empiricists have assumed, that more ordinary views hold the actual world $\underline{T}$ to be consistent. More ordinary views are inclined to be far more tolerant than logical empiricism, for example, towards positions of a non-empiricist cast such as, to take a wide but instructive sample, religious, mystical and dialectical positions. The options to pure contextual theories are rather more diverse than might have been expected (see §7) and include both paraconsistent and consistent positions which qualify (3) and allow for some clashes.

Pure contextual theories, even if they can be worked out satisfactorily, are not sufficiently in the spirit of the theory of items to be acceptable. In some respects they belong rather to the opposition to object theory; for similar contextual relativisation could be used to dispose - with diminishing plausibility as the method is more widely applied - of most of the data in favour of the theory of objects. For example, 'Pegasus is winged' could be said to be true in a suitable context, one concerning objects of mythology.

Nor is the contextually-intensional position that the pure contextual theories lead to, any more than explicitly intensional theories, ultimately satisfactory. (Intensionality results because the base shifting function the context supplies involves world shift.) A serious objection is that fictional objects becomd mere shells. There is nothing for the intensional properties to grip upon (cf. the transcendental argument of chapter 6), nothing to distinguish fictional objects contingently from one another, etc. Contextual and implicitly intensional positions also fall down badly on comparisons, such as 'Holmes is a detective but Harold Wilson is not'. Etc.

There are, it seems certain, a variety of statements we make truly concerning fictions which do not seem to be intensional or purely referential, and, secondly, emerging from this, the truth of some of these statements appears to require the truth of other extensional statements about fictions. Among the first class of statements are ones like the following: "Holmes was written about by Doyle", "Green correctly described Holmes", "Mc X looked like Holmes", "Woods prepared an indentikit photograph of Holmes", "Stout was shorter than Holmes". But in order for someone to look like Holmes, or correctly describe Holmes, Holmes must presumably have properties of this and that kind, be a man of such and such a build, gait, etc. Some (quasi-) extensional claims presuppose, or generate, other extensional claims. There are also other good reasons why the contextual intensionality thesis associated with option (PC) has to be modified, namely that there are a variety of extensional claims about Holmes that we have already recorded, e.g. "Holmes did not exist", "Holmes' birth was not recorded on the London register", "Holmes had no funeral", that are not adequately dealt with by referential contexts (cf. again the "problem" of negative existentials).

§8. *Integration of contextual and ordinary naive theories within the theory of items.* The way back to positions that are in the spirit of the theory of items from the intricacies to pure contextual theories is not difficult to discern. The way is to combine the ordinary theory of items (as expounded in Chapter 1), specifically by restricting the correctness of ratifications in principle (2) to characterising predicates. So, in particular, a character does not acquire noncharacterising features such as existence because an author ratifies its existence. Thus the ch/nonch distinction renders (2) compatible with (1). Sayso works only up to characterisation, to ch features. In short, (2) is sharpened to

$2A_0$. What an author ratifies in the way of characterising features for his or her characters holds.

Because all characterising features are extensional, difficulties of the absolutely naive theory (of §1) over James Bond's proof that E = NR are automatically avoided. A character cannot be characterised as proving what is impossible, knowing what is false, and so on for other intensional success functors. Naturally the work may ratify that one of its characters did some of these things, and then that the character did so will hold in the world of the work.

To obtain the full intended scope of $2A_0$ a suitable wide construal of 'character' has to be taken for granted. For $2A_0$ extends to apply to many objects introduced in a work of fiction that are not ordinarily accounted characters, e.g. natural objects such as mountains, woods, streams, marshes, trees, cliffs, rocks and artefacts such as towns, buildings, rooms furnishings, clothes, coaches, trains, automobiles, ... On the other hand, not all objects mentioned in a work of fiction are "characters", i.e. (in the wide sense) largely characterised in the work; for example, London is not a "character" of the Holmes stories, nor would Mr. Disraeli be if he figured therein. Better than so stretching 'character' is to adopt terminology that marks the intended distinction between objects that are characterised in a work and those that are not; and happily suitable terminology is already in use. In 75 Parsons distinguishes creative and noncreative uses of names in literature: 'The "creative" use ... is the use of a name in a work of fiction in which that character is created', whereas 'noncreative' uses concern characters 'whose identity is already established outside the story' (p.79).[1] This distinction is subsequently (in Parsons 78) transposed to the more satisfactory material mode distinction between native and immigrant objects: an object native to a work is one that is named in a creative use of a name, an immigrant to the work by a noncreative use of names. The distinction, that already made, is, as Parsons explains it, 'roughly whether the story totally "creates" the object in question, or whether the object is an already familiar one imported into the story' (78, III 1). The one object may of course be native to some works, those in which it is characterised, and immigrant to others. The intended scope of principle $2A_0$ is to objects native to the work in question. Thus $2A_0$ may be reformulated as follows, in a way which allows both for plural authors (or no authors) and, by construing 'work' widely (as with 'opus') for a series of works:

$2A_1$. An object native to a work N has the characterising features the work attributes to it.

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[1] 'Creative' in the sense tying with being created in a story: it has nothing to do with having been brought into existence. Parsons adopts the account of creating a character given in Crittenden 73.

Principle $2A_1$ - which will require further minor adjustment - is derivable from a key assumption of the integrating theory of items, a Characterisation Postulate, according to which an object has all its characterising features. To derive $2A_1$ it suffices to identify (extensionally) an object native to a work with an item that has the features attributed to the object in the work: then apply FCP. To illustrate consider again (the) Holmes who is native to a certain series of works of Conan Doyle. He is characterised (now) as a man who was a detective who lived in London in Baker St., etc.; in short as ιxxh.[1] Then, by FCP, that object was (necessarily) a detective and lived in London, i.e. (ιxxh)d & (ιxxh)il. To complete the argument, apply the contingent identity, Holmes = ιxxh) It follows, then, by substitution that Holmes was a detective, lived in London, etc.

Apart from the (initial) Identification Assumption, that Holmes = ιxxh - which implies that contingent identities hold true concerning fictional objects, e.g. that it is no mere fictional truth but a matter of fact that Sherlock Holmes is (identical with) the man who was a detective, etc. - just two main assumptions are drawn from the theory of items (both like the first assumption equally questioned by and equally anathema to empiricism), namely FCP and the principle of replacement of extensional identicals in extensional frames.

In a similar way, using the principles, many other commonsense truths, and much high school knowledge, such as that Tom Sawyer ran away from home and that Scrooge encountered several ghosts, may be established (direct confirmation may of course be had by consulting the original works). Such truths are, unlike (ιxxh)d which is a necessary truth, contingent truths. They are (in contrast with the pure contextual theory) true in the actual world $\underline{\underline{T}}$ in nonfictional contexts. That is, with statements such as (Sherlock Holmes) d no base transfer is required; for, with respect to such statements as (Sherlock Holmes)d, $\underline{\underline{T}}$ and the world of Sherlock Holmes overlap, i.e. such statements hold in both these worlds.

Principle $2A_1$ tells us which characterising features a fictional character has, but gives little or no information as to which features characters do not have. Yet we know quite well that Holmes was not blond and was not eight feet tall and that he did not live in Gin Lane or visit Brasil. How do we know? The initial reasons may appear to be diverse: living in Gin Lane would have been "out of character" and, anyway, don't we know he lived elsewhere?; if he'd have been as tall as that it would surely have been remarked, especially as he would have had considerable difficulties on his numerous travels, and, as with blondness we have counterinformation; and as regards visiting Brasil, well, it does not emerge from anything in the stories. A common denominator of the various characterising features Holmes does not have seems obviously to be this: they do not derive from anything, not just in the stories, but in the source book for Holmes. The reasons why it is unsatisfactory to confine consideration to the story are the same as those given in §1 for adding to what stories say to arrive at the appropriate world, especially the material additions designed to include matters certainly intended but not said in the stories (for derivability will take care of formal closure conditions). But given that a source book is obtained by additions (and perhaps subtractions) like those for a world, and accordingly is appropriately (and so perhaps vacuously) closed, it would be doubling up to say: Among characterising features an object of work N only has features derivable from those ascribed to it by source S(N). As derivability, of whatever requisite sort, has already been allowed for, 'derivable from' can be deleted, so yielding

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[1] The tensing issue is clarified somewhat when work N is replaced, in the final formulation of 2A, by the source book for the work. For while the work may make present tense statements about its characters, a present source book elaborating a past work can make past tense statements about the characters.

2B. Among characterising features, an object native to work N has only those features its source S(N) ascribes to it.

Since commonly S(N) is closed under entailment, so commonly 2B will not exclude consequences of features characters have. For example, if a normal work ratifies that Hot Pants was placed first, then 2B will not deliver the result that Hot Pants was not placed. Thus 2B is straightforwardly compatible with the common logic of fiction (of §2).

The formulation given of 2B suggests that the formulation of $2A_1$ is insufficiently strong. That is so: the reasons for introducing the source book in the case of 2B similarly show that $2A_1$ should really ascribe to objects all the characterising features their sources attribute to them: else they will be missing features their sources say they have. Call the resulting formulations of $2A_1$, 2A ('the work' in $2A_1$ is replaced by 'source S(N)'). Then 2A and 2B can be neatly combined in the final form:

2F. An object native to work N has all and only those characterising features which source S(N) attributes to it.

Principle 2F is derivable from the theory of items, given an identification assumption for objects native to works of fiction. For arbitrary N, let d be an object native to N, and let F be the set of characterising predicates S(N) attributes to d. That is, $f \in F$ if $S(N) \vdash df$ (i.e. $df \in S(N)$) and ch(f).[1] Then d is an object such that for every chf, $df \equiv f \in F$. What has to be shown is that for every chf, $df \equiv f \in F$. Consider $d' = \xi x(chf)(xf \equiv f \in F)$. By HCP, some object does satisfy the condition C: $(chf)(xf \equiv f \in F)$. Hence by $A\xi$, $(chf)(d'f \equiv f \in F)$. Further d' is unique up to characterising features, i.e. if both d_1 and d_2 satisfy condition C, then $(chf)(d_1f \equiv d_2f)$. Hence $(chf)(df \equiv d'f)$, whence the result.

It remains to further explain source books (the notion of a source (book) for an object was introduced back in 1.25). It is advantageous to make use not just of source books for objects but also of source books elaborating works (or series of works). The approximate model for source books elaborating works is provided by (what is stated in) modern supplemented and annotated editions of the (or a) work of some historical author.

Source books for works of fiction are propositional in character.[2] There need be no written or otherwise recorded account, and in general will not be (that is why the term 'source' is sometimes used: to remove any impression that an actual token book is required): source books are like what they are mostly sources for, nonentities. A source book is *compiled* from both *primary* sources, in the case of fictional objects from works of fiction, but in the case of dreams or visions from the experiences, and *secondary* sources, e.g. historical and geographical information, commentaries, discussion (where the object figures as in immigrant object), etc. A source book stands to its primary sources much as a world stands to the same works. The compilation consists of material elaborations, supplied from the secondary sources, together with application of appropriate closure requirements. As with determination of worlds too (especially if a modal account is mistakenly attempted) some deletion may be required, e.g. to filter out inconsistency, as well as extraneous and misleading commentary. The very considerable similarity between source books elaborating works and worlds of works strongly suggests identifying them. The following connection can be argued for: where N is a work, the source book S(N) elaborating N is the propositional representation of world $\underline{\underline{a}}(N)$, i.e. S(N) is given by $\{p : I(p, \underline{\underline{a}}(N)) = 1\}$. In the limiting case of a work with just one character such a connection results fairly automatically.

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[1] Subsequently (in §9) it will be shown, what is important, that this restriction to ch features can be removed. This depends on use of s-features, which are left out of consideration until that stage.

[2] The propositions involved will usually be "tensed", but they do not have to be. Sources can be of a range of sorts, as will emerge. The source book may be past source book for objects presented as being at that time or in the past; they may be present source books for the same objects; they may be "timeless" source books for four-dimensional objects, etc.

In principle, source books *for* objects are excerpted from source books elaborating works to which they are native. Take the (union of the) works to which a given object is native; excerpt the material about or relevant to the object; and then apply essentially the same compilation process as before to obtain the source book for the object. Where source books are obtained only by addition or where the source book S(d) for an object d is compatible with the source book S(N) for the series of works N to which d is native, $S(d) \subseteq S(N)$; and for the theory S(N) can be used in place of S(d) (since the extra information is immaterial and is erased when characterising features of d are considered). The source books for objects may overlap. Consider Frodo and Bilbo. The works or primary sources N are the three volumes of *Lord of the Rings* together with *The Hobbit*. Then s(Frodo) and S(Bilbo) overlap since there are many situations in which both are involved. For the purposes of obtaining characterising features it is enough to consider S(N), since $S(\text{Frodo}) \cup S(\text{Bilbo}) \subseteq S(N)$.

Using source books for objects the native/immigrant distinction - which is somewhat restrictive, since other objects also satisfy a principle like 2F - can be bypassed, and the sayso principle formulated:

2G. A (fictional) object d has just those characterising features its source S(d) ascribes to it.[1]

2G follows from the theory, given an identification assumption. The principle holds much more widely than simply for fictional objects: it holds for imaginary objects, and, with a suitable extension of the notion of source, it holds not merely for nonentities, but for all objects.

The worlds of reality and of works of fiction have, given 2F, limited coincidence. As regards any characterising feature, for any d of N, $I(df)(\underline{\underline{T}}) = 1 = I(df)(\underline{\underline{a}}(N))$. However, as regards noncharacterising features and intensional features $\underline{\underline{T}}$ and $\underline{\underline{a}}(N)$ are very different. Almost paradigmatically, where d is a main character, $I(dE)(\underline{\underline{T}}) \neq I(dE)(\underline{\underline{a}}(N)) = 1$, as even if N does not actually say d exists, d will stand in such physical relations to other objects that are taken to exist that the proposition that d exists will belong to S(N). These agreements and differences will be reflected in agreements and differences concerning truth-value assignments in different contexts. Thus as to characterising features, assignments with respect to fictional and nonfictional contexts will coincide but on noncharacterising and intensional features they will commonly diverge. For example, where c_1 is fictional and c_2 is nonfictional, typically, $I(dE)(\underline{\underline{T}})(c_1) = 1 \neq I(dE)(\underline{\underline{T}})(c_2)$. For, assuming no other contextual details require taking up, $I(dE)(\underline{\underline{T}})(c_1) = I(dE)(\underline{\underline{a}}(N)) = 1$, whereas $I(dE)(\underline{\underline{T}})(c_2) = I(dE)(\underline{\underline{T}}) \neq 1$.

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[1] This principle gives the original form of the theory for nonfictional contexts. Formulations $2A_1$-2F are influenced by Parsons' work, especially 78, borrowing the native/immigrant distinction. Source books can of course be independently explained as in 1.25.

The difference between the pure contextual theory and the integrated theory can be summed up as follows: in the pure theory almost every nonreferential but extensional statement is transferred to the world $\underline{\underline{a}}(N)$ of the story for evaluation. What is left of the objects and characters of the story N in world $\underline{\underline{T}}$ is but a shell of certain noncharacterising features - a shell which is not structurally self-supporting or sound. By contrast, in the integrated theory objects of the story have a quite rich make-up in $\underline{\underline{T}}$, for all their characterising features hold. The world $\underline{\underline{a}}(N)$ of the story will be as on the pure contextual theory.

§7. *Residual difficulties with the qualified naive theory: relational puzzles and fictional paradoxes.* The trouble with the qualified naive theory summed up in 2F is that it still appears liable - despite the qualification of (2) to characterising features, the restriction to native objects, and the use of source books - to run us into clashers with empirico-historical facts, through violations of the principle that an author of fiction cannot interfere with or upset empirical fact. It is important to show the appearance is misleading, and that the integrated theory can resolve apparent clashes, in one way or another. The clashes always concern, and are bound to concern, relations between nonentities and entities. (Properties are unproblematic unless they are relationally tied.) There are two main cases to consider:- First, there are the relational puzzles already considered concerning inferences from relations that do hold, e.g. the apparent clash between the truth that Holmes lived in London, deriving from 2F, and the empirical fact that London had no such Holmes living in it. Secondly, there are fictional paradoxes generated by replacements of extensional identicals in truths which relate fictional objects to entities. Neither case is peculiar to fiction; both bear on the general question of relations of nonentities (especially pure ones) to entities. The cases are considered in turn.

1. Relational puzzles. A different example will reveal that the puzzle has nothing essentially to do with fictions, but is a puzzle (in the first instance) as to the relations between entities and nonentities (and one that has already been alluded to several times, especially in 1.21).[1] It would be a mistake to leap to the conclusion that the puzzles show that there is something wrong with nonentities: they reflect just as much on entities (and many of the problems for the logic of nonentities might be ascribed, not just by a joker, to the erratic behaviour of entities).

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[1] (Footnote on next page.)

Consider a (or the) philosopher who assassinated Russell, and who perhaps has other characterising features as well (they can be rolled in with the predicate 'p'). Call the object Hook; so Hook = $\xi x(xp \& xgr)$ say. Then by FCP, Hook g Russell. But it is fact that it is not the case that Russell was assassinated, i.e. ~(Russell was g).

The resolution (already defended in 1.21) is simply that Hook g Russell does not imply a (Russell was g), that the relation is reduced, and so does not sustain intransitive passive conversion. Moreover, to obtain passive conversion in the logic itself- as distinct from in the informal translation into logical form - two additions would have to be made to the second-order logic: it would require, first, the inclusion of passive logical forms (or at least an alternative form to the one it has), and, second, and more important, active-passive conversion axioms. Free λ-categorical logic which can accommodate the forms, still require the latter axioms. But the latter axioms do not hold for all objects. For example, to vary the vexing stock Holmes-London example, "Holmes blew up London" (after he joined the Goon Show) does not imply "London was blown up".

"The"conversion resolution divides into two somewhat different resolutions, according as it said that the faulted inference in intransitive passive conversion is that to "London was blown up by Homees" or therefrom to to "London was blown up". Although the first passive-blocking resolution was favoured in 1.21 and will be favoured here, both options will be left open. In certain respects the second demodification-blocking resolution is more straightforward than the first. It has its problems however, and it is just as readily made fun of: the analogue of the joke "So Holmes is the man who blew up London whom London wasn't blown up by!" is the joke "So London is the city that wasn't blown up that was blown up by Holmes!" Referential jokes like "So Holmes is the man who blew up the city that wasn't blown up!" have to be lived with: not a difficult feat compared with what most honest philosophers have to tolerate. Talk of "the object who blew up the city that wasn't blown up" may sound strange to ordinary ears but it is consonant with similar initially "strange" sayings, deriving from the theory of items, such as that someone squared the circle, because a person who squared the circle squared the circle. Of course the someone is an impossibilium; no actual person could have pulled off the feat. In a similar way the mafia Holmes is not an entity.[1]

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[1] (Footnote from previous page.)

Hence it reveals another respect in which the purely contextual theory of fiction, whether or not extended to apply to all nonentities, is not in the spirit of the theory of objects. For if it is not extended then fictional objects are treated very differently from other nonentities; while if it is extended, then the theory effectively says that all characterising-type truths about nonentities are at bottom (after taking up context) other wordly statements and not true in nonfictional contexts, which now coincide with referential ones.

If it is extended then the theory is like a contextual version of the Castañeda and Rapaport multiple modes of predication theories, dismissed in 12.4.

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[1] On some accounts of possibilia, the mafia Holmes is not even a possibilium. That surely tells against those accounts of possibilia.

Such examples as the circle squarer show further that relational puzzles are not confined to relations between nonentities and entities, but also affect relations between nonentities. Let the circle squarer be the person who squared the ideal circle, so the relation is between nonentities. Then conversion would yield the result that the ideal circle was squared. The resolution is as before: such conversion is inadmissible.

While there are alternative resolutions and are objections to the conversion resolution (i.e. resolution through modification of conversion axioms), as will soon become evident, the resolution and the examples will provide a working model for what to say about fictional cases such as the Holmes-London case. Certain options for nullifying the apparent clash of data have already been eliminated or can be eliminated immediately; but is worth being a little systematic in order to try to exhaust the range of options as to what can be said and to reveal just how many options there are that might (just) be pursued. Almost all the options involve either further restricting, in one way or another, the class of characterising predicates, or reducing relations (so they do not support all classical inferences), or, as it often turns out, both. In the classification for nonfictional contexts[1] which follows, predicates are restricted to those that are extensional (at least in the *main* place, i.e. the subject position of traditional grammar):-

A. *Relational predicates* of the form gb, where b is a nonentity, *are never characterising*. It would follow that nonentities never stand in characterising-type relations to entities. There are stronger and weaker versions of this position:

B. *Nonentities satisfy no c-extensional predicates*, i.e. extensional predicates of the type previously listed as characterising (to exclude problems over extensional predicates such as 'does not exist'). This is the classical position already rejected as radically unsatisfactory.

B*. *Nonentities satisfy some c-extensional predicates*. Among these

C. *They satisfy only one-place predicates*. This previously discarded position involves a hard-to-enforce-or-justify distinction (at least for natural languages) between one-and many-place predicates. The position also largely cripples the theory of objects, not merely in the case of bottom order objects (it prevents us distinguishing in the obvious way between Kingfrance and the present king of China), but especially as regards higher order objects. For it destroys relation theory which is at the heart of mathematics (see chapter 10).

C*. *They satisfy some many-place predicates*, as relating to nonentities. This position suffers many of the difficulties of C. But the difficulties can be somewhat mitigated by the strategy of *duplicate replacement*, as illustrated by the replacement of 'Homes lived in London' by 'Holmes lived in the London of the Holmes' stories', $hil^{\#}$ for short, where the # superscript (read, roughly 'duplicate') indicates the duplicate object of the relevant work.[1] The idea, more generally, is that where agb and b exists but a does not, 'b' is replaced by '$b^{\#}$': what 'agb' was intended to say (or meant?) was $agb^{\#}$. Prima facie, this is false, as respective embedding of 'agb' and '$agb^{\#}$' in frames will show, e.g. agb & ~agb is contradictory but $agb^{\#}$ & ~agb is not. Such a general strategy has already been jettisoned (in §4) because it forces ambiguities where there appear to be none, e.g. 'lived in London' means something different according as it is Holmes or Hampshire we are speaking about. Nor can we infer that they lived in the same city. The strategy is, as the difficulties are beginning to reveal, yet another replacement stunt and open to the crucial objections lodged against such nonuniform replacement moves in 1.7. The strategy also sabotages the theory of items, breaking down some of the data, and enforcing an artificially sharp division between entities and nonentities. For example while the king of Tonga is presumably king of Tonga, Kingfrance is not guaranteed king of France or France$^{\#}$ (however that is characterised?), but Kingfrance$^{\#}$ is king, not of France, but of France$^{\#}$!

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[1] Thus as regards the classification, context plays a more meagre, though by no means negligible, role. Such distinctions as that between referential and nonreferential contexts remain important; so do the usual roles of context in identification of time, place, speaker, etc.

The rejection of the strategy of duplicate replacement has an important corollary, namely that statements of fiction are not about duplicate objects. For example, hil is about what it seems to be about, Holmes (primarily) and also London; it is not about London$^{\#}$.

A*. Some relational predicates of the given form are characterising. It is evident that sufficiently many predicates of the given form will have to be characterising, including predicates like 'lived in London' and 'is king of France', else we are back with the positions and difficulties under head A.

D. There is no problem with examples like "Holmes lived in London".

E. There is no clash with "London was lived in by Holmes". For that is true. What is false is that London was lived in by an existent Holmes. London's population divides (in a way reminiscent of Lewis's distinction of denotation and comprehension) into an actual population, to which Holmes doesn't belong, and a much larger fictional population, to which Holmes does belong. To explain why no trace is to be found of Holmes in the city records, by the watchers, etc., it is enough to say that Holmes was not a member of London's actual population: the records only pertain to inhabitants who existed. There is no need (here at least) to appeal to reduced relations: conversions can be simply accepted. Reduced relations are essential given the same is to be said of action predicates, such as 'blow up', 'occupied', 'assassinated', etc., which permit intransitive conversion. (The alternative is to try to distinguish such "action" predicates, and to treat them differently, e.g. by adopting the unpalatable course of returning to head A.) For that London was blown up, or occupied in the nineteenth century, is false. Given further that full passive conversion is said to be inadmissible, such inferences as "London was blown up by Holmes; so London was blown up" are ruled incorrect. That's alright, it's said: the antecedent shows that the job was the work of a nonentity, so detachment to a statement that removes this qualification is not to be expected. And that's why there is no clash. The inference is no better than those to the same conclusion from such premisses as "London was blown up in the military exercise [on the invasion plans, in the film, according to the news, allegedly, ...]". As will become clearer in what follows the demodification blocking resolution encounters serious difficulties. For example, it is in trouble with fictional paradoxes, which appear to compel some qualification on free-wheeling passive conversion. It is in the embarrassing position over truths about London, which depend on what is, or is it what might be, written about London, etc. But many philosophical theories have encountered, or simply ignored, much greater difficulties, and flourished.

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[1] When it is necessary to specify the relevant work N, because context fails in the task, #(N) will be used.

E*. There is a clash; but

F. It is only apparent. This compromise position is obtained by trying to exploit the predicate/sentence negation distinction. Since predicate negation differs from sentence negation, "Holmes did not live in London" differs from "It is not the case that Holmes lived in London". Inconsistency is avoided by saying, none too convincingly perhaps, that all that empirical evidence establishes is "Holmes did not live in London", and that this is not inconsistent with "Holmes did live in London". However unless the theory of items is modified, the position collapses. For as Holmes is possible, h~il implies ~(hil). The option can accordingly be discarded.

F*. It is not merely apparent, but such clashes are paraconsistently unproblematic. According to dialectical positions clashes do occur, but (in contrast to the absolutely naive theory) clashes are limited because authors do not have an unrestricted licence to ratify whatever they choose. They cannot ratify that their characters have noncharacterising predicates; in particular, they cannot ratify that their characters really exist, i.e. clause (1) of the naive theory cannot be (also) negated. These positions do seem to explicate better than any of the options that find ambiguity everywhere, the ordinary naive theory reflected, for example, in the high school teaching and examination of English courses, where no regimentation is required, there no syntactical distinctions are made, e.g. between "fictional" and "empirical" forms, or the like. But to say, as these positions may, that it is simply true both that hil (because 'il' is ch) and ~hil (because of the historical records) is not merely rather advanced for these "consistent" times, but does induce contradictions where they are not forced but are misleading and can be avoided by other more satisfactory options. It would be a mistake to dismiss such positions too hastily however; for they do, in contrast to most of the putatively consistent positions, approximate the ordinary naive theory in a way that has little or no artifice. And asked whether Holmes lived in London or not, respondents sometimes do say 'Well, he did and he didn't', without any qualification which would indicate ambiguity. But asked to elaborate, respondents typically (in contrast to cases of genuine paradox or inconsistency) resolve the conflict in one way or another, e.g. by contextualisation. With good reason: for Holmes is not a paradoxical object, which induces seemingly irreducible inconsistency, but representative of a large class of consistent objects which should not generate inconsistency. Naturally the theory should be able to cope with paradoxical objects, such as the famous village barber who shaves all and only those villagers who do not shave themselves, since a work of fiction may well include paradoxical figures among its characters. But while some large concessions have thus to be made to the paraconsistency point - while indeed a fully adequate theory of fiction will most probably be paraconsistent - the extent of paraconsistency should not be permitted to run wild, and far beyond its proper boundaries. Accordingly option F* can be closed off.

D*. *There is a problem alright: but*

G. *It can be averted in syntactical ways*. The strategies all involve introducing additional notation which separates out elements that are supposed to lead to the clash. (A semantics may accompany, or more likely reflect, the new syntax.)

Thus they all involve finding ambiguity where, so it has been argued, there is none, and making extensive formal replacements where, so it has been claimed, none are required. So eventually they all should be rejected. But it is worth enumerating the options, and remarking upon some of the main options, all of which have been suggested or tried.

G1. The predicate term in sentences like hil is ambiguous between the actual London which can be represented 'London^E', and the fictional London (in question), 'London$^\#$'. The move has already been considered and found wanting under C*.

G2. The copula 'lived in' is ambiguous as between two modes of predicates, actuality predication, with copula 'lived in^E', and fictional predication, 'lived in$^\#$'.

This move, advocated for instance in Casteñeda 79, is sharply criticised in 12.4. Since it is, like G1 a replacement project (for part of English), it is open to the damaging objections of 1.7. Both G1 and G2, and a further move

G3. Of finding ambiguity in the subject term (Kripke's move, considered in §3),

are specialisations designed to explain the ambiguity in the sentence hil. The parent doctrine, which they all support is

G4. There is an ambiguity in the sentence hil, and more generally in all sentences that yield true assertions in both fictional and nonfictional contexts.

The generalisation indicates, what is right, that insofar as there is something to be said for those distinctions, it can be taken up contextually: it is *not* a matter of logical grammar. According to G4, however, the fictional truth or statement, (hil)$^\#$, must be given different logical representation from the empirical falsehood (hil)^E. (Not so: although different notation *can* of course be introduced, it does not reflect the natural language data, and the requisite point can be much better made by distinguishing, as before, nonreferential and referential contexts, in which the one unambiguous sentence can occur.) As always, it is better to say that there are two different sorts of statements (one true, one false) rather than that there are two kinds of truth. Inevitably then, there is ambiguity. The ambiguity in A, as between A^E and $A^{\#}$, must devolve onto sentence parts. There are as many points to locate ambiguity as there are parts of speech, and in complex sentences ambiguity could be located almost anywhere, e.g. in adverbs. But there is a basic form where ambiguity has to be found somewhere, according to the referential thinking that usually underlies option G, namely the relational form agb. That leaves basically 5 proper places at which to account for the ambiguity (excluding agb): a, g, b, ag, gb.[1] It remains to consider the important

G5. Relational and adverbial strategies. Such moves find an ambiguity between hil and h{il}[2] or between {hi}l and h{il}, where {il} indicates that i and l adhere in some closer way yet to be explained than i and l usually do in relational statements.

Different positions, result according to the tightness of the adhesive (ultimately the effect had on logically operations) and/or the leading analogy exploited. Among them are, in approximate order of logical liberality,

(i) concatenation,

(ii) adverbialisation,

(iii) hyphenation, and

(iv) plugging-up á la Parsons.

Some of these devices have already been explained (e.g. (i) and (iii) in 1.21) and criticised. Hyphenation and concatenation at least have the advantage of occurring in natural language (though hyphenation is probably being assigned a new, at least a considerably extended, role): they distinguish hil from, respectively 'Holmes lived-in-London' (hi-l) and 'Holmes livedinLondon' ($h\overset{\frown}{il}$). Adverbialisation, though it has of course natural language analogues, is contrived: hil is distinguished from 'Holmes lived in-London-mode' or 'Holmes lived Londonishly' (hilly). Plugging-up[3] distinguishes, like hyphenation which it resembles in the two-place case, [hi]l with the relation plugged-up on the left from h[il] with the relation plugged-up on the right; and both may differ from hil. More generally, where f^n is a many-place predicate term and t a subject term, $(ft^i)^{n-1}$ is an (n-1)-place predicate term plugged-up in the ith place. While the filling-up of places is quite in order classically, the order of occupation does not matter in the way it does with plugging-up.

Each of (i)-(iv) restricts logical operations concerning subjects and other expressions in adhesive positions. (i) blocks virtually all operations; (ii) stops conversion and closes off 'London' from all logical operations but permits substitutional quantification on modes (e.g. for some mode m, himly); (iii) (presumably), and (iv) allow quantification but preclude (or limit) identity replacement and limit conversion. What logical apparatus like (iv) permits is very much open to determination since there is but little intuitive control. In each case then there is no way to proceed from hil, now *replaced* by or properly represented as h{il} to {hi}l, or to hil itself.

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[1] Or perhaps 6 if <a, b> is counted.

[2] To take the right-hand side. There is an analogous case for the left-hand side.

[3] Introduced by Parsons 74, apparently following a suggestion of Chisholm's.

So the problem is averted. But at a considerable and unnecessary cost. For what does {hi}l say? In every case something about London, that London was inhabited Holmesishly, etc. But in this event *the requisite point can be made without resort to special symbolism*: it is that such relations do not convert, that hil does not imply "London was lived in by Holmes, $li^{P}h$ for short. All that is required is English, not such symbolism.[1]

A point about the *logic* of relations has been mistakenly converted into a point about *syntax*. In place of elementary logical restrictions on relations, what is offered is syntactual reformation which can ensure draconian logical restrictions. Positions (i) and (ii) are certainly of this sort; they can be ruled out at once on the grounds that they preclude perfectly legitimate quantificational arguments, e.g. to take a trivial case to "Holmes lived in some place". The situation is rather like the identity issue considered in 1.11, where complex solutions to puzzles can be avoided by a more straightforward resolution which they effectively guarantee in any case. It is the same with Parsons' theory: for when we climb out of the notation what is said is to be true is this:

a. Holmes had the property of living in London; i.e. h[il].

b. London did not have the property of having been lived in by Holmes; $\sim(l[i^{P}h])$.

c. It is false that Holmes lived in London; ~(hil).[2]

The key distinction between a and b is (after λ-conversion) simply that between "Holmes lived in London" and "London was lived in by Holmes", in traditional grammatical terms between active and passive. The complexities and restrictions of plugging-up are unnecessary to make the requisite distinction.

Why furthermore, in defiance of the ordinary naive theory, accept c ? Parsons identifies hil with h[il] & hi[l] ? (For what hil comes to in Parsons' theory is the referential form $h^{E}il$.) Granted one can define a technical predicate $hi^{+}l =_{Df} h[il]$ & [hi]l, why equate hil with $hi^{+}l$? The reason for rejecting the equation is, naturally, that hil is true, not false, but $hi^{+}l$ is false because [hi]l is false. The referential domination assumption which leads to the equation needs its credentials checked. Parsons' theory diverges then from commonsense in rendering 'Holmes lived in London' ambiguous between h[il], [hi]l and hil, assigning the statement the truth-value true only for the special predicate [il]. The usual objections to such locations of ambiguity where there appear to be none can be brought against the strategy, as well as these evident points. We don't have to learn Parsonese in order to truly ascribe 'living in London' to Holmes. Many who will never master plugging-up can do that. If the theory is a rational reconstruction (as most such theories reasonably enough are) then it has moved rather far from its data base, since we use the one predicate in saying hil and (Hampshire) il. There is finally a puzzle as to what the new predicate [il] means, since it doesn't mean il: Parsons' semantics doesn't really explain the matter. The question is especially important for replacements within intensional sentence frames.

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[1] But perhaps with some help from traditional grammar in selecting a main place, *the* subject in statements, so that it can be said that 'hil' is primarily about Holmes.

[2] Compare what Parsons says about "Holmes met Gladstone" (78, III 13), where the case for plugging-up relations is given what little motivation it gets.

In sum, the relational strategies are unnecessary. They are avoided by the simple procedure of using passive forms. They are moreover undesirable in several respects. They lose intuitive control with new symbolism. They multiply up gratuitous ambiguities. They incur the difficulties of replacement moves. They make the wrong assignments to hil.

> G*. It can be averted without such formal artifice. For the trouble lies not in the sentential form hil, but in the assumption that the relation expressed is an entire one. The leading idea is that already presented: that the truths supplied by characterisation principles, from source books, about fictional objects such as Holmes take such forms as "Holmes lived in London". But these truths do not entail converted forms, such as "London was lived in Holmes" for the relations are reduced; and accordingly the truths are not incompatible with information about London that can be gleaned from historical records, such as "It is not the case that London was inhabited by Holmes".

The separation of the active and passive forms agb and $bg^{p}a$ may look artificial to the classically-trained who see no place for and have no notation for passive forms, but it is not. Firstly, it has a long and good pedigree in traditional grammar (nor are the forms on a par in modern grammar). Such formulae as agb are not transformable to $b\breve{g}a$ (where g is symmetric) without loss, for a is the subject of agb but not of the transformed formula. (Nor are they interchangeable in highly intensional frames.) Adopting traditional grammar let us say that agb is principally about a while $bg^{p}a$ is principally about b. This is a first step in putting agb and $bg^{p}a$ to properly separate uses (and why have two forms if this cannot be achieved, one might opportunistically ask?), and leads to a second reason for separating the forms and applying the distinction. The source book for Holmes, compiled from the Conan Doyle series, supplies the ch predicate 'lived in London', whence derives the truth 'Holmes lived in London'. It is not a source for London. The source for London, derived from the historical record, does not deliver the predicate 'was lived in by Holmes'. Hence, given that this predicate is a characterising one, it is false that London was lived in by Holmes.[1] Therefore the truth of "London was lived in by Holmes" does not follow from that of "Holmes lived in London". (If philosophers were to insist that it does, it would very likely turn out that they were appealing to a referential context, where the conversion is admissible because the relation is not reduced.) The neutral theory of relations not only does not (as was explained in 1.21 and 5.5), underwrite all instances of active-passive conversion; it would err if it did. Notice further that the separation of forms, though like one of the resolutions of alleged "ambiguity", avoids admission of ambiguity. For there is not one form which is ambiguous as between two forms, but two forms. Thus is the ambiguity charge escaped.

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[1] Naturally this is not what the demodification-blocking resolution says. As to what it does say, there are again various options, most of them problematic.

There is inevitably a hitch to the pleasant separation of forms, and it is this: suppose the source book supplies the predicate 'London was lived in by'? There are several options as to what to say:

(i) The source book does not supply such predicates; alternatively, such predicates though supplied are

(ii) not characterising,

(iii) characterising but misleading as to form,

(iv) characterising and not misleading but simply reflect an inconsistent source book.

(iii) and (iv) are uninviting for reasons already given. It is unsatisfactory to say that such predicates as a matter of fact do not occur in source material for source books.[1] They might, and we can easily arrange a story in which they do. But a filter can be imposed in obtaining source books from source material. So (i) seems to be viable. However if the principle of minimizing deletion, if possible reducing it to zero, is to be seriously retained, then course (ii) is preferable, namely accepting only active forms as characterising. This involves recognising and distinguishing active from passive forms, but again traditional grammar can help out. Nor need it involve any loss of expressive power, e.g. where a primary source is written mainly in the passive. Active closure will simply be adopted as one of the closure principles in compiling the source book.

The differences between the forms can be brought out in symbolic ways that take G back towards G^*, for instance by extending what English provides, hyphenation. Then redundancy can be recovered if really desired, by setting l-ih equivalent to hil and h-il equivalent to li^Ph; so is passive conversion approximated.[2] Yet another way, with a better basis in English is this. The first statement hil concerns primarily, Holmes; and, adapting the scoping notation of p.153 to a new purpose, it could be represented [h]hil, i.e. 'As to Holmes, ...'; whereas the second statement li^Ph primarily about London, could be symbolised [l]hil, 'Concerning London, ...'. There is a case for considering and elaborating on this symbolism (which has its fun aspects and its point, as well as its own problems),[3] even if there is not a case so far for adopting it. For it is important to be able to extend the way the passive changes the main subject to other two-place relations and to many-place relations of high adicity. The operator [ ] read, variously, 'as to', 'concerning', 'as regards', 'for', 'is such that', has the requisite effect. Consider, e.g., 'a is between b and c', which has 'a' as main subject. To emphasize c, to make the statement about c rather than a, apply the operator to c and the statement to get [c](a is between b anc c), read e.g. 'c is such that a is between b and it (c)'. An interesting thing now happens. Much of the common case that is made out for introducing variables as adjoined to quantificational operators goes over largely intact to showing that [ ] operators should likewise be combined with variables. Consider, for example, the reasons Quine offers (in ML, pp.66-7) for variablization: compactness and convenience 'instead of 'it' with different subscripts'. But the as to operator leads to subscripted its in precisely the way quantifiers can. Apply Quine's argument steps to: number c is either less than or equal to or greater than d, number c h_0 number d, for short. Emphasizing d results in

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[1] It is probably the case that the predicate 'London was lived in by' does not occur in the Doyle Holmes' stories, and so would not reach the source book. But it would be pointless to conduct a search to find out, since the logical points do not turn on such contingencies as exactly what is not written.

[2] Much as 1.21, A-B is h(A, B) with h the hyphenation operation, usually (but not essentially) restricted to suitably juxtaposed A and B. How hyphenation generalises depends on the conditions imposed on it, e.g. usually hyphenation is associative $(A-B)-C \approx A-(B-C)$, but ordered hyphenation can be envisaged, whereupon plugging-up would be a special case. It is very open, and very artificial.

[3] One of the problems, that of scoping (1.23), vanishes where there are no eliminations to effect, and with it the point to scoping. Here however [ ] takes on a new role.

7Q. Number d is such that number c h_0 it.

But now similarly emphasize c (inside the 'such that'). So results

8Q. Number d is such that number c is such that it h_0 it,
which is inadequate. What is required is rather

14Q. Number $d_{(1)}$ is such that number $c_{(2)}$ is such that it$_2$ h_0 it$_1$,
or more elegantly (following Quine's symbolic lead, p. 67).

17Q. (dx) number (cy) number (yh_0x).

Thus emerge singular quantifiers, such as (dx)A(x). The notation is an improvement on [d]A(d). For it shows, as does the particle 'it', that the operator binds the place within the wff, and so prohibits substitution on the second occurrence of d in [d]A(d).

The formation rule for singular quantifiers which are now tentatively introduced is as follows: where A is a wff not containing subject constant d and x a subject variable, then (dx)A is a wff.[1] Evident axiom schemes for singular quantifers within the framework of neutral relation theory are these:

1. $(dx_1)((x_1,\dots,x_n)f) \leftrightarrow (d_1,\dots,x_n)f$

2. $(dx_i)((x_1,\dots,x_n)f) \rightarrow (x_1,\dots,\underset{i}{d},\dots,x_n)f$, for $1 < i \leqslant n$.

Classically, where all relations are entire, and so any subject place can be the main place, 2 would be strengthened to a biconditional. And then the point of introducing singular quantifiers would be largely lost, since, at least for all initial wff, they are redundant.

3. $(dx)A \leftrightarrow A$, x not free in A.[2]

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[1] A less conservative approach would introduce such quantification for all subjects, whence such wff as (zx)A(x), read for example 'z is such that it A'.

[2] A distributional scheme,

4. $(x)(A \rightarrow B) \rightarrow. (dx)A \rightarrow (dx)B$,

may also hold. The semantical theory of singular quantifiers is not yet sufficiently developed for this to be clear.

Some of the earlier notation can be very roughly approximated using singular quantifiers, namely passive predicates and main places:

(i) $bg^{P}a =_{Df} (bx)(agx)$.

It is not pretended that this definition captures all that the passive achieves. But it does provide some of what is required in the logical theory. Firstly, it brings the exclusion of passive predicates as characterising under the general rubric that predicates involving quantification are not characterising. Secondly it explains, through axiom 2, why a source book commonly includes the active when its primary source includes only a passive form.

(ii) d is the main subject place of A(a) $=_{Df} (dx)A(x) \leftrightarrow A(d)$.[1]

But a better theory, taking in passive forms and their many-place generalisations, and important parts of traditional grammar, has still to be devised.

2. Fictional paradoxes and their dissolution. Fictional paradoxes - which so it turns out are but intensional paradoxes and dissolved in the same way (as in 1.11) - take the following form:-

$A(a)$ Aeneus defended Troy, a high and windy city.

$a = b$ Troy is a low and airless village in Asia Minor.

$\therefore A(b)$ ∴ Aeneus defended a low and airless village in Asia Minor, a high and windy city.[2]

But $\sim A(b)$.

The logical error is, as before, intersubstituting extensional identicals in intensional places. The only trouble, if it is, is that some of the places where replacements are proposed look extensional. Consider, to get back to Holmes, the following example:

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[1] Singular quantification also enables a start - a very poor start, as results quickly show - to be made upon defining plugging-up within the theory (without hyphenation), thus

(iii) $a[gb] =_{Df} (ax)(xgb)$; $[ag]b =_{Df} (bx)(agx)$; $ag^{+}b =_{Df} a[gb] \,\&\, [ag]b$.

Then $\vdash h[il] \leftrightarrow hil$; $\vdash [hi]l \rightarrow hil$; $\vdash ag^{+}b \leftrightarrow [ag]b$. Hence, especially in view of the last equivalence, the approach is inadequate. Nor can it be made good by another theory of singular quantification, e.g. without axiom 2, short, of some surprising additions. For although plugging-up has some features in common with binding, e.g. it stop identity substitution, it is not binding. Whereas using singular quantifiers b in [ag]b cannot be quantified - at least on the theory so far elaborated - it can be quantified in [ag]b, e.g. to yield $(Py)[ag]y$. In the elaborated theory the latter would become $(Py)(yx)(agx)$.

[2] Both the term 'fictional paradoxes' and the example are taken from V. Routley 'Lost in Meinong's Jungle' (unpublished lecture notes, 1969), as is other material in this chapter, in particular the thesis that fictional objects have the characterising features determined by their source books.

agb Holmes lived at 221B Baker St.

b = c 221B Baker St. = Bigshots Brewery.

∴ agc Holmes lived at Bigshots Brewery.[1]

The argument involves the following steps when rendered more explicit. By the minor premiss, whenever ext f, if (221B Baker St.)f then (Bigshots Brewery)f. So, assuming that ext(Holmes lived at ...), if Holmes lived at 221B Baker St. then Holmes lived at Bigshots Brewery. 'Holmes lived at' looks extensional, doesn't it? Well does it, when the relation is "plugged-up" with a fictional object? More important, the theory reveals, by a somewhat circuitous but rewarding tour, that it can't be extensional.

Theme 1. The conclusions of fictional paradoxes cannot be merely accepted, e.g. as surprising truths.

Theme 2. As with relational puzzles, "fictional paradoxes" have nothing essentially to do with fictional objects.

It might be thought that the bullet could simply be bitten. Holmes did live at Bigshots Brewery and somehow, despite appearances, his lodgings must have been in the brewery. Contrary to what we thought source books have to be closed under extensional identity! But consider the object, not one of fiction, simply characterised as living at 221B Baker St. and not living in Bigshots Brewery; or to vary the example, the pure object with just these features: living at 13 Bilge Ave., not living at Bilgeview Hotel.

By HCP the latter object, call him Slurb, has just the characterising features of living at 13 Bilge St. and not living at Bilgeview Hotel, and no others. Hence it is not the case that Slurb lives at Bilgeview Hotel. Evidently Slurb is a consistent object. But in fact 13 Bilge Ave. is the Bilgeview Hotel. So if extensional identity could be substituted, Slurb would live at the Bilgeview Hotel, contradicting his not living there and also Slurb's consistency.[2] Hence substitution is not admissible, and the bullet cannot be swallowed. Since further the substitution is excluded, 'Slurb lived at ...' is opaque, and therefore the place is intensional.

Theme 3. The places held by terms signifying entities in relational characterising predicates are not in general extensional, though the characterising predicates themselves are.

Thus while 'lived at Bilgeview Hotel' is extensional, the place held by 'Bilgeview Hotel' is not extensional, and hence neither is the predicate 'lived at'. Though the latter predicate is frequently extensional in both places, for example, but not only, when both places are restricted to entities, it is not invariably extensional.

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[1] Adapted from an example discussed in Parsons 75, p.84, and ascribed to D. Lewis. In fact Doyle obliged by having in 221B Baker St. a fictitious address, so the Holmes' watcher^E or afficionado on Baker St. would not find a 221B. But that the example involves altering the facts a bit doesn't interfere with the point it makes.

[2] Such replacement failures are not confined to fiction. Replacements of contingent identicals within mathematical frames, e.g. in statements of category theory, will likewise cause problems.

Theme 4. An important respect in which relations holding of nonentities are sometimes reduced concerns the extensionality of their places.

The general intensionality of minor subject places in characterising predicates is to be expected given the very considerable freedom there is in filling these places, and given the way in which what holds characteristically of a fictional object ties directly, through the source book, with what holds in an alternative world, that is, given the way in which extensional characteristics of fictional objects are, so to say, intensionally induced. The general intensionality of the minor places neatly solves a long-standing and vexing problem, namely how is it that the indeterminacy of nonentities does not transfer to entities to which they are related, and so contradict determinacy requirements on existence. The answer is that intensional indeterminacy of entities is unproblematic.

The dissolution of the fictional paradoxes is again a virtually minimal one, which is presupposed by other resolutions. Only the inferential patterns that lead to the difficulties are qualified (but through the back-up extensional identity theory which is now fitted into reduced relation theory). No syntactical transformations and no replacements are required. Thus the dissolution contrasts with the Parsons-Lewis resolution (in 75) which calls for considerable syntactical reorganisation, and also with a duplicate-objects blocking of the argument, by replacing 221B Baker St., for instance, by its duplicate 221B Baker St.$^{\#}$, that is in effect by transferring the intensionality to the objects. Then of course the minor premiss, now 221B Baker St.$^{\#}$ = Bigshots Brewery, is false. But duplicates, though they can be introduced (sometimes, but not necessarily, in a way that imports more problems than they are worth), are once again not required: nor do they really get to grips with the original problem, which remains unresolved.

§8. *The objects of fiction: fictions and their syntax, semantics and problematics.* So far the main focus has been on solving problems concerning the statements of fiction. Although these issues are bound to and do bear substantially on the objects of fiction, fictions - for the reason that true statements of fiction determine the properties of fictions once the objects are discerned - they leave open several vital questions concerning these objects, questions as to their quantificational behaviour, as to their identity, as to their essential nature, etc.

Logically, the main enlargement of the theory called for is the extension of statemental logic to quantificational logic and beyond. The logics - likewise leading features of the semantical theory - are as before (in the relevant case, as in 1.23), but there are some additional details, e.g. in extending the common logic of fictions.

1. Common quantificational and second-order logics of fiction. The common quantificational logic of fiction results by combining qualified relevant logic (GQ to take a working example) with the sentential logic of §2, i.e. the logic adds to GQ the representative functor 0 subject to the postulates cited in §2 together with the quantificational analogue of $OA \& OA \rightarrow O(A \& B)$, namely the Barcan principle: $(x)OA \rightarrow O(x)A$. The converse $O(x)A \rightarrow (x)OA$ can be proved, much as $O(A \& B) \rightarrow . OA \& OA$ is provable, as follows:- $(x)A \rightarrow A$, by instantiation; $O(x)A \rightarrow OA$, by R7; and so, by generalisation and distribution of U, $O(x)A \rightarrow (x)OA$. Although the Barcan fictional principle is, again like $OA \& OA \rightarrow O(A \& B)$, avoidable in more logically esoteric fiction, it holds for

common cases. Objections to principles of this type, as to the original Barcan (modal) principle, mostly arise from reading the quantifiers as existentially-loaded and (as before) dissolve given the neutral, existentially non-committed, construals.

The semantical analysis of the common quantification logic of fiction with neutral quantifiers simply enlarges on semantics for relevant logics (of 1.23). It involves, among other things, a class K of normal worlds to which world T belongs, and a domain D of objects only some of which at most exist. To treat of all of fiction, both usual and logically esoteric, the semantics is embedded in the universal semantics, in particular K is included in the set of all worlds W. The base shifting function of the contextual theory selects in fictional contexts worlds of W, or, in the case of logically common fiction, of K, at which to start on semantical evaluations. In case of nonfictional contexts evaluation commences at T, but when the context is referential the base is further constricted to G.

The worlds of fiction conforming to the common logic are closed under deducibility, and accordingly pose no difficulty for the thesis that $T \in K$, that the actual world is appropriately logical. However fictional worlds in W-K which do not conform to the common logic may not be closed under deducibility, but yet supply truths that hold in T, and accordingly do appear to cause a problem, the $T \in K$ problem. For most purposes outer worlds in W-K present no difficulties because whatever holds in such world is covered by a functor in T. Suppose, e.g., entailment principles break down drastically in d's dream world, so that although A holds B does not though provably A entails B. What holds in T is not A but aDA, i.e. "a dreamed that A"; and aD is not systemic; the principle, $A \Rightarrow B \rightarrow aDA \Rightarrow aDB$, is incorrect. What the theory of items does that is different is to allow A in certain cases to hold in T as well as in d's dream world, e.g. where A is of the form bg with a characterising predicate predicated of a term signifying a dream item. The problem is not as severe as might have been anticipated because of the doctrine of reduced relations (which includes a modified theory of definability). For instance, because of reduced solutions there is little or nothing bg will imply in virtue of g. Certainly bg will imply $bg \vee bh$, but this is immaterial: T does not have to reflect the logic of d's dream world. Indeed the problem may very well vanish altogether with reduced relations. In case it does not, well the thesis that T belongs to K can be qualified, without serious damage if it is done carefully, but with some complication of detail.

The common second-order logic of fiction is reached in a similar way to the first-order logic. The postulates of §2 are added to a second-order relevant base together with the Barcan fictional principle formulated for all variables, i.e. $(u)OA \rightarrow O(u)A$, where u may be a predicate or sentential variable as well as a subject one.

The solid case for introducing neutral quantification becomes especially evident with discourse concerning fictional objects. By contrast, most going logics prohibit any such simple and direct approach as that which neutral logics afford, and immerse us (as we have seen) in a fantasy world that is stranger than much fiction. The basic reason for neutralisation is once again that we often want, and need, to be able to talk objectually about and quantify over items that do not in any way exist, including fictional objects.

For example, we want to be able to infer, by particularisation, from "Da Costa thought about Holmes and Woods thought about Holmes" that there is some one object that both da Costa and Woods thought about, but *not* that there exists an object satisfying this condition, since the object in question, namely Holmes, does not exist. Nonexistential quantifiers are wanted to formalise quite familiar statements and discourse about fictional persons. Nor need fictional subjects reached by quantifiers be always embedded in intensional positions. Consider the evident (but nonetheless disputed) truth "David Copperfield did not exist but might have" from which it follows that something did not exist but might have. Or again, the statement "Sherlock Holmes was written about by Conan Doyle" is true, with the proper name 'Sherlock Holmes' as the (apparent) subject, i.e. the statement is about (perhaps among other things) Sherlock Holmes.[1] Since it is about Holmes we can certainly infer that, for some x, x was written about by Conan Doyle, but again we do not infer that there exists such a person. Similar quantified forms are not uncommonly, and quite legitimately, used in statements by people who fail to recall names, consider e.g. the exchange: 'Some detective was written about by Conan Doyle. Do you remember his name?' 'Sherlock Holmes'. 'Yes, that's the man'.

2. *Avoiding reduced existence commitments and essentialist puzzles*. But all fictional objects exist in some world! (Which is to claim that a weak world-relativised version of the Ontological Assumption can be fallen back upon.) Even if they were to so exist that would hardly be of much help, since the worlds in question are beyond the actual, and accordingly do not exist. (Moreover the problem above concerning apparently extensional frames would remain.) But in fact fictional objects need not exist in any world. A work of fiction may include all sorts of objects that do not exist, e.g. ghosts, witches, gods (even narrators of parts of the story), and in principle there is no reason why even main characters should be taken to exist. A book may introduce leading characters which, so it turns out, or so the author may insist, do not exist (e.g. Virginia Woolf could have redrafted her final novel so that the shadowy Percival did not exist). Let k be such a figure in work N. Then N ratifies $\sim kE$, i.e. k does not exist, and so $O_N{\sim}kE$ and $(Px)O_N{\sim}xE$. Also, given N's logic is usual, $O_N(Px){\sim}xE$. Use of existential quantifiers here would be somewhat disastrous for the consistent story.

Mostly we do not make the same presumptions about fictional objects that we make about objects we believe exist (but maybe *don't*). For generally in the case of fiction we are all well aware that the objects do not exist. Nor do we (all of us) "suspend belief" as is so often asserted; we simply do not apply the not uncommon but not invariable contextual assumption that discourse is existentially loaded. Fiction is not "make believe".

A fictional object does not exist, and may not exist in any world, e.g. impossible characters. But could a consistently characterised fictional object exist? Could Holmes have existed? ($\Diamond hE$?) Yes, both on the theory presented and the ordinary naive theory. On the theory, the identity of Holmes with the item with the characterising features of Holmes' source book is an extensional identity, as it should be. For Holmes might have been characterised differently, he might have had a different source book. In fact he might have had $\underline{\underline{G}}$ as a source, and been extensionally complete rather than seriously indeterminate in many respects. Holmes could be different from what he was, much as Zeno Vendler might have been different from what he is (see 1.14). Some small arguments which purport to show that necessarily Holmes did not exist remain to be dealt with, namely:-

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[1] The statement concerned is not quotational: Doyle did not write about the name 'Sherlock Holmes' but about Holmes. But the Reference Theory requires that the commonsense truth that the statement is about Holmes be rejected.

(i) Necessarily fictional objects do not exist. Holmes is a fictional object. Therefore necessarily Holmes does not exist. The argument would only be valid were it necessary that Holmes were a fictional object. But it is not necessary. The invalid form may be represented: $\Box(A \supset B), A \therefore \Box B$.

(ii) Necessarily the x which is f is f, where f represents a complete listing of Holmes' characterising predicates. But Holmes is $\iota x x f$. So necessarily Holmes is f. Similarly then, since necessarily the x which is f does not exist, because nothing so incomplete can exist, necessarily Holmes does not exist.

However, the identity replacements made are illicit. $h = \iota x x f$ is an extensional identity which cannot be used correctly for substitutions within modal contexts. So the arguments fail.

In a similar way other essentialist puzzles may be dissolved. For example, fictional characters may have had features different from the features they in fact have. It is only contingently true that Hamlet was a prince; he might not have been. All such essentialist difficulties for a theory of fictions are uniformly avoided through the theory of (extensional) identity.

3. Transworld identity explained. The integrated theory presupposes that (Holmes, T), i.e. Holmes at the real world T, is the same as (Holmes, c), where c is a world of Holmes' stories (e.g. one of the worlds a base-shift function takes evaluations to). That is, it supposes that Holmes can be identified, or traced, across worlds. It is also supposed that quantification across worlds, with Holmes as a value of bound subject variables, is legitimate, as, e.g., in the semantical evaluation of $\Box(x)(x = x) \rightarrow \Box(\text{Holmes} = \text{Holmes})$. Such theories have been charged with raising especially severe problems concerning the objects of quantification and their identity conditions, the matter of exact identity conditions for objects at different worlds being dubbed 'the problem of transworld identity'. But for the most part the "problem" is a further manifestation of the Reference Theory, and arises from thinking that Holmes, for example, must be some sort of subsisting object whose sameness across worlds is to be settled by referential criteria. But the situation is not like that at all.

What has added fuel to the heat of this problem is that even commonly accepted qualified identity principles, such as extensional identity criteria, get left behind, so it appears. For example, one and the same Holmes can be the fictional character Doyle wrote about who did not actually live in London,[1] and, in the world of a Holmes story, the detective who did live in London; that is, Holmes has various properties in one world, that of empirico-historical fact, but not in another, and yet is the same. Examples are easily multiplied. Before too much is made of this phenomenon of change of properties, even of extensional properties, of objects from world to world, it should be remembered that there is a parallel phenomenon with regard to change of properties of objects over time, for example one and the same person is both hirsute and bald, both male and female, not at the one time naturally, but at different times of their lives. And although more simple-minded versions of Leibnitz's law break down, appropriately qualified versions continue to hold (see chapter 2).[1] There is a parallel problem, with a similar logical form, for objects across worlds, namely when is (x, c) i.e. x at c, the same as (y, d), where c and d are in one case times and in the other worlds. (Temporal sections are like worlds, as semantical analyses of tense logics have emphasised.) In the case of fictional worlds the question as to criteria is very simply answered in a way which has an appealing uniformity with earlier answers delivered by the naive theory: namely sameness is determined (by or) from authors' sayso as for other propositions that can be recorded in source books. To be sure there are limits on what an author can pull off in this respect; he cannot by his sayso make the city of London into a number or even a motor car: there are category and type restrictions he cannot transgress. But the London of an author's work can be very substantially different from the London we have visited, and, for example, rather more like present day São Paulo: his London is much hotter than we remember, the people are very different and speak Portuguese, most of the landmarks we know are gone and we are surprised by the size and efficiency of the downtown bus terminal and the disappearance of the tube system. So much is easily explained through an alternative history, e.g. the world's climate has changed and after the Third World War Brazil assumed world dominance in place of the ruined United States. With a still larger story an author can even put London outside England (in something the way London Bridge is), but limits are now being reached (not to say the point of calling the place 'London' at all, if all the old features of London begin to disappear, since the associations and "lift off" gained by taking advantage of familiar features of an actual place in a work of fiction are lost). In sum, what controls sameness across worlds is qualified author sayso, the qualification being that a core of features of the object must be preserved.[2]

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[1] Here 'actually' serves as that functor which narrows truth-value assessment to G, and, more generally, constricts holding at a to c(a) (cf. 1.17(7)). It is not being denied that it is true that Holmes lived in London.

There is no need to try to settle every case of identity or difference here, or accordingly to try to explain what is meant by a core: these things can be, like many everyday identity puzzles, a matter for cheerful indecision, as Wisdom has explained (56, chapter 1). There are any number of objects, and entities, for which we cheerfully lack, not clear enough identity principles, but decisive identity criteria - to hit (again) at another dogma of empiricism. To adapt some of the jargon of modern empiricism, decisive criteria for object identity are sometimes a Don't Care. It is a little tempting however to try to link the notion of a core with that already introduced, of an alternative history: for example, the core requirement is satisfied in the case of an author's London if there is a path linking his London with the historical London at some time in its history.[3]

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[1] There are important questions not decisively settled by duly qualified Leibnitz, e.g. the matter of the identity of a person over time. For even when the criterion is clear, whether dated properties hold may not be.

[2] The answer accordingly has a good deal in common with Kripke's reply to Lewis and others on identity across possible worlds (see 71): sayso is stipulation, but Kripke's stipulation has also to be qualified, and there are cases, e.g. of counterfactual worlds, where the matter is not one for stipulation at all.

[3] Here at least we can (tenuously) join forces with causal theories.

4. *Duplicate objects characterised.* Statements about the relations of fictional objects to actual objects cannot be adequately replaced by statements about the relations of the fictional objects to duplicates of the actual objects, e.g. hil cannot be satisfactorily paraphrased as $\text{hil}^{\#}$. Duplicates do not enable main problems about fictional objects to be resolved, but introduce a new set of difficulties of their own (so it has been argued in §7). Nevertheless duplicate objects can be characterised, and there is occasion to introduce them since they are sometimes spoken about in non-philosophical discourse (sometimes as the result of bad theories no doubt, but not always).

For example, it is true to say that Holmes' London had a 221B Baker St, in symbols $\text{London}^{\#(N)}\text{b}$ (whereas on the main option taken it is false that London had a 221B Baker St.). A corollary is that duplicate objects are not extensionally identical with what they duplicate; $\text{London} \neq \text{London}^{\#(N)}$. They may differ moreover not just in spatiotemporal location but in central traits: a duplicate object need by no means be *exactly* like or even *very* like what it is duplicate of (thus the term 'duplicate' is stretched somewhat in this application, much as Lewis's analogous use of 'counterpart' departs from more common usage).

As to identifying duplicates, their leading feature is that they are determined by the worlds in which they occur, for instance $\text{London}^{\#(N)}$ by the world $\underline{\underline{a}}(N)$, Shakespeare's England by the England of the worlds of Shakespeare's works, etc. Thus $\text{London}^{\#(N)}$ is an item with just the (characterising) features ascribed to London in S(N). Hence $\text{hiLondon}^{\#(N)}$ is true since $\text{London}^{\#(N)}$ satisfies the ch predicate hi. In elementary cases,

$$I(d^{\#(N)}f)(\underline{\underline{T}}) = 1 \quad \text{iff} \quad I(df)(\underline{\underline{a}}(N)) = 1.$$

More generally the Identification Assumption for duplicates is (anticipating the *final* form of §9) as follows: where d is immigrant to N, F_d is a set of features asscribed to d in S(N), the N-duplicate $d^{\#(N)}$ is identified thus:

$d^{\#(N)} = \xi x(f)(xf \equiv x \in F_d)$. Hence *were* d native to N, $d^{\#(N)} = d$; and although d is immigrant to N, $d^{\#(N)}$ is treated as native to N.

§9. *Synopsis and clarification of the integrated theory: s-predicates and further elaboration.* The integrated theory integrates the contextual theory[1] of fiction with the qualified naive theory of fictional objects. A (purely) *fictional object* is one that is characterised in fiction. Fictional objects are not the only objects that occur in fiction, that works of fiction are about, since for example actual and historical objects also occur. The full characterisation of a fictional object is given in (or by) its *source* book, which is determined from the works of fiction in which the object is characterised (not in which it merely appears incidentally or as introduced from elsewhere). *A fictional object has all and only those characterising features ascribed to it by its source.* This principle, which is a fundamental one is determining what is true in nonfictional contexts of fictional objects, derives from Characterisation Postulates in the following way:- Where d is any fictional object and $f_1, \ldots, f_n$ are all the characterising predicates ascribed to a by its source S(d),[2] then $d = \iota x(xf_1 \;\&\; \ldots \;\&\; xf_n)$.

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[1] A sometimes-actual object may occur in fiction, and be ascribed features it does or did not have. Such an object is not *purely* fictional, but it *has* a fictional duplicate which differs from it.

[2] (Footnote on next page.)

More generally, the set of characterising predicates is exhausted in the set $F_d = \{f_i : i \in N\}$ for a suitable indexing set N, and $d = \iota x(f \in F_d)xf$. Hence, by FCP, $df_1 \& \ldots \& df_n$, and more generally for each $f \in F_d$, df; that is d has all the characterising features ascribed to it by its source. Moreover as regards characterising features, these are the only characterising features a has, as HCP will show. For by HCP (of 1.21), there is (neutrally) an x such that for every characterising predicate f, xf iff $f \in F_d$. Furthermore x is unique up to characterising features.[1] Let d coincide with this c (or such an x). Then $df \equiv f \in F_d$.

There are various shortcomings in the theory so far presented which can be overcome by the use of s-predicates which have so far been left out of the (already complicated) picture. For example, just as the theory without s-predicates fail to distinguish the golden mountain from the existing golden mountain (see 1.21), so the theory of fiction fails to distinguish properly distinct characters who are differentiated through noncharacterising features. The difficulty can be evaded by adding the following closure principle to those used in the complication of source books: wherever f is ascribed to an object, ascribe sf also.[2] More serious is a connected inadequacy in the initial Identification Assumption. Holmes is, so it will be objected, the man with all the features his source book ascribed to him, not merely those characterising features so ascribed, as the Assumption has. By adopting a different identification assumption, and using s-predicates and KCP', this telling objection can be met (cake can be had and eaten too). For in fact various different fictional objects can be distinguished. Let d be an object and S = S(d) the source for d. The full object d is the object that has all the

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[2] (Footnote from previous page.)

Predicate f is ascribed to a by S(a), where S(a) considered as a theory (in the wide sense of RLR) contains af as an element. Put otherwise af is immediately inferable from S(a). (To say af is deducible from S(a) while in order in the usual case, would be wrong for deductively open objects.)

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[1] Suppose otherwise both x_1 and x_2 satisfied the account, i.e. $(chf)(x_1f \equiv f \in F_a) \& (chf)(x_2f \equiv f \in F_a)$. Then $(chf)(x_1f \equiv x_2f)$, i.e. x_1 and x_2 coincide in characterisation.

On Parsons' theory 78 this would imply, what is false, that x_1 and x_2 are identical under a strong determinate, namely Leibnitz identity. There is much appeal, however, in the proposition that coincidence in characterisation implies extensional identity, i.e. $(chf)(x_1f \equiv x_2f) \rightarrow x_1 = x_2$. The reason is that noncharacterising extensional predicates appear to be, by and large, consequential or supervenient: for instance, whether something exists or incomplete or self-identical depends on what traits it has. But there are also counterconsiderations caused by apparently distinct objects with the same characterising features. So the question has been left open, since such an axiom is nowhere essential. Really a better resolution of so far unclassified extensional predicates into characterising and noncharacterising is needed first.

[2] That rule generates its own problems, naturally: e.g. for the counterexample writer who tries to characterise a philosopher who satisfies certain predicates but not their matching s-predicates. But since the rule can be avoided, as will become evident, so are the associated problems.

features precisely that S ascribes to d, and the *full extensional object* (fe object) d is the object which correspondingly has precisely the extensional features. The full object has, like the initial object hitherto identified, all characterising features, but it also has all noncharacterising features (including all intensional features) ascribed to it in S in s-forms, e.g. if according to S(d) d exists then dsE, d has presentational existence, etc. Similarly the fe object has as well as all characterising features all remaining extensional features ascribed to it in s-form. Hence the initial object is embedded in the fe object which is in turn embedded in the full object (embedding being defined through properties held: $b < c$ iff $(f)(bf \rightarrow cf)$).

The *final*, or full, *Identification Assumption* extensionally identifies object d with the full object. Let F_d be as before and let $G_d = \{g_i : i \in M\}$ be the set of all features ascribed to d by S (by suitable set M). According to the Assumption $d = \xi x(g)(xg \equiv g \in G_d)$, i.e. d is in fact any object with just the predicates in G_d. Now by KCP', taking A(g) as $g \in G_d$, $(g)(z_0Sg \equiv g \in G_d)$, where $z_0 \approx \xi x(g)(xg \equiv g \in G_d)$. It follows that $d = z_0$. It further follows, as ext(sg) because ch(sg), that $(g)(z_0Sg \equiv g \in G_d)$ is extensional (by compounding principle (Ext P) of p.232). Hence by replacement

d_1. $(g)(dsg \equiv g \in G_d)$.

What has to be shown is

d_2. $(chf)(df \equiv f \in F_d)$.

Suppose $f \in F_d$ and ch(f). Then $f \approx sf$ (see p.270), and as $F_d \subseteq G_d$, $f \in G_d$. Hence by d_1, dsf, and so df. Suppose conversely df for f characterising. Then $f \approx sf$, so dsf, whence by d_1, $f \in G_d$. But chf so $f \in F_d$.

Therefore, by d_2, the full object d *has* precisely the characterising features ascribed in S(d). Accordingly *d does not differ in characterising features from the initial object* (assuming now s-features are counted in), say $d' = \xi x(chf)(xf \equiv f \in F_d)$; for by HCP,

d_3. $(chf)(d'f \equiv f \in F_d)$,

whence $(chf)(d'f \equiv df)$. Thus *as far as characterising features go* - perhaps as far as extensional features go - *it does not matter whether the initial or full object is taken* in the identification assumption. But it surely matters intensionally.

Consider now an elementary statement of the form af for some fictional object a and some (extensional) predicate f; e.g. af is that worn-out statement hil with subject 'Holmes'. To evaluate af in context c, there are, on the integrated theory, three main cases:-

α. c is *fictional*. Then af is evaluated in the way explained in the pure contextual theory, i.e. the base is shifted to the relevant world and af is evaluated there.

α^*. c is *nonfictional*.

β. c is referential. Then af is evaluated at G. So, in particular, where g is any characterising predicate, ag is assigned false (i.e. I(ag)(G) = 0), because qu(a) lacks a referent, a being a fictional object. This is the classical assignment, where ag is evaluated just like $a^E g$.

β*. c is nonreferential. Then af is evaluated at T. Where f is a characterising predicate I(af)(T) = 1 according as f belongs to F_a, i.e. according as f is ascribed to a by its source.[1]

Thus the example "Holmes lived in London" is true in cases α and β* and false in case β. Naturally the cases are not exhaustive, for 'Holmes' has other roles,[2] e.g. in a suitable context 'Holmes' could signify a certain Braidwood gander in which event the statement would in fact be referential and false.

Cases α - β* provide an important part of the base case for an inductive truth definition (of the sort included in the universal semantics); they are the crucial cases for a theory of fiction. Indeed given a language in which all noncharacterising predicates (such as E and =) are defined and all intensional predicates can be regarded as being composed of a sentence functor in combination with an extensional predicate, almost enough is already given to apply (in a notional way) the universal semantics and so derive definitions of central notions from the theories of truth and meaning (as given in 1.24).

§10. *The extent of fiction, imagination and the like.* Fiction in both philosophical and older popular senses includes much that is not fiction. But what it also includes is amenable to treatment within the theory of items (of course): much of what deserves to be accounted fiction or fictionlike or associated with fiction - imaginative or artistic products - operates logically and semantically according to the general principles already sketched for fiction in the narrower modern sense.

1. "Fictions" in the philosophical sense. The fictions of literature and the media, of novels and some poetry, of science fiction and comics, of much of television and film, of drama and opera, to take main examples, are only some among the types of fictions that figure in philosophical discussion, especially older discussions (e.g. Bentham's). Much of philosophy, especially reductive empiricism, has been concerned with other "fictions", logical and scientific fictions and legal and political fictions, including, for example, universals such as Matter, Time, the State, the Law, or again such objects as average items, nations, multinationals, and so on. Detailed classifications of such objects may be found in Bentham 32 and in Vaihinger 49. Most of these objects, which are abstractions (including abstractly defined items), have markedly different logics and properties from those of fictional objects, and should be classified separately, and given the different treatment they deserve (see chapters 5, 8 and 9). Since it is, it turns out, decidedly misleading to account such objects "fictions", the philosophical sense is best abandoned.

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[1] The astute reader will have observed that this neutral classification of contexts corresponds in a very rough way to Kripke's platonistic classification of usages (set out in §3).

[2] So do the other terms. In particular, 'London' may signify Holmes' London, in which event there is a further (quasi-analytic) case to consider under (β*).

In addition, there are many objects not considered of much importance by Bentham and Vaihinger that resemble the fiction of literature and the media much more closely than the "fictions" they concentrate upon, the fictions of myth and legend and, differently, what may be called the fictions of imagination, the objects of dreams and daydreaming, of private or shared fantasy and imagining.

Despite the significant differences between these very various types of objects - some of which we will come to - they have important features in common. One feature they all have in nonexistence; they are certainly not the solid material preceptible preferably-kickable individuals empiricists favour, and in many philosophers' eyes are to be shunned and never spoken about, or, if not so avoidable, reduced to items that do exist. But, as the later Meinong might almost have put it, none of these objects exist in any way at all, yet they are in general irreducible to objects that do exist, and require for their integrity no such reduction. Like other objects that do not exist they have extensional features, they have all their characterising features, as guaranteed by appropriate Characterisation Principles. But they differ significantly in their sources, and sometimes in the way they are apprehended.

2. Imaginary objects, their features and their variety: initial theory. Basic to a comprehensive theory of fiction is a direct analogue of Meinong's unrestricted assumption principle, the unrestricted imagination, or freedom of imagination, thesis: there are no restrictions on what is imaginable (even the unimaginable is imaginable). One can imagine anything one likes, of any sort, abstract or particular, bottom or higher order, no matter how bizarre or whether inconsistent, incomplete, paradoxical or absurd. Indeed one of the few special principles of the logic of imagination is the thesis $(x)\Diamond Ix$, for any item it is possible to imagine it.[1] Implicitly restricted quantifiers are of no avail here: items violating any restriction can be imagined. Only a logic of all items, a theory of items, is adequate to encompass the range of items concerned.

Restrictions come, not with what is imagined, but with the features had. Just as an assumed item may not possess all the properties it is assumed to have, so an imagined or imaginary item may not have all the features it is imagined or otherwise supposed to have. What features are had by imaginary objects are, as with that subclass of imaginary objects, purely fictional objects, in fair measure determined by their core features, characterising features supplied by their sources (as in principle 2F). As with fictional objects, there are limits on what can be so ascribed; in particular severe limits are imposed by empirico-historical facts. Other features had, ontic, intensional and so on, are typically by no means independent of the core characterising features had, though they are also externally constrained, e.g. by $\underline{\underline{T}}$, by the havers of intensional attitudes, etc.

The major difference between various sorts of imaginary objects - as with types of fiction - lies in their sources, especially in their primary sources. An important difference that may be included under difference in source, resides in the way the sorts of objects are apprehended or encountered. For an important class of imaginary objects, distinct from fictional objects, presentation is experiential. Of course images are had, objects imagined, and so forth, in the course of absorbing a story, but the mode of presentation is different. Such objects as those of visions and dreams are *perceptually presented*, and their primary source consists of such presentation. Thus the primary source for dreams objects is dreams, 'series of pictures or events, presented perceptually to the sleeping person' (OED) or creature (since other animals dream); for daydream objects, daydreams or series of daydreams, which resemble dreams except that the subject is awake; for objects of visions, 'supernatural or prophetic apparitions'; etc. Other features that are distinctive or idiosyncratic for objects of perceptually presented sorts also derive from their source, e.g. the fragmented nature of dreams, their unmemorability.

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[1] A special case of imagination is that where the objects are propositional in kind, e.g. given in the form, that A. In this event the statements can be reexpressed using such sentence functors as xI 'x imagines that' and I 'it is imagined that'. Many of the points made in 8.12 as regards belief then apply, mutatis mutandis, except that the logic of imagination is nonsystemic.

Given the primary source N the rest can be elaborated more or less as before. For instance, where N is a dream or a series of dreams, S(N) is the source compiled from N, and $\underline{\underline{a}}(N)$ is the dream world of N ('dream world' is a term that can be transposed directly from ordinary discourse to worlds semantics). In "M^cX dreamed that Holmes was tailing him" the transfer in semantical evaluation is to the world of M^cX's dream. Where d is an object, unlike Holmes native just to N, S(d) is included in S(N) and can for most purposes be equated with S(N). But there are certain notable features, e.g. the closure conditions in determining $\underline{\underline{a}}(N)$ are usually exceedingly weak. Correspondingly, there seems to be no common logic of dreams as there is, it has been argued, for fiction. Some dreams will have their internal logic, but again, as with fiction, there can be no logic of dreams.

Previous problems will reappear too in a somewhat new setting, relational puzzles, dream paradoxes, questions as to how to identify extensionally dream objects, etc. With imaginary objects such as dream objects it certainly seems preferable to identify the object with the fully described item that has *all* features described in the source, i.e. the *full* object. The requisite Characterisation Postulate will then act as a filter to deliver only the characterising features ascribed as held, others will be merely presented, e.g. the object which is green will be presented as existing, presented as valuable, etc.

3. *Works of the fine arts and crafts, and their objects*. Works of the fine arts are almost invariably works of the imagination (cf. OED, under 'art'). Since works of the imagination are frequently about what does not exist, works of the fine arts are frequently about what does not exist. Even where the works are occupied with what does or did exist (or maybe will exist), as in portraiture the (former) entity portrayed is imaginatively conceived, a duplicate is envisioned, and if the work is realised or actualised, what is produced is a duplicate, an object which resembles the original, the model, but also differs in ways not merely due to the medium in which it is produced, but reflecting the way the modal is imagined.[1] If the work is not actualised or not completed or not perfectly realised, the intended object is again one that does not exist. The point about nonexistence generalises: much of what count as the arts, much of what is accounted culture, is concerned with objects of the imagination, with what does not exist. It is no mere accident that a predominantly commercial material civilization like our own is, despite

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[1] The objects of portraits have much in common logically with those of legends, considered below.

its great monetary wealth, so culturally impoverished.

The fine arts are something of a mixed bag philosophically: they include, according to OED (under 'fine'), 'those [arts] appealing to sense of beauty, as poetry, music, and especially painting, sculpture, architecture'. In principle they include tapestry, weaving, landscape gardening, and indeed any of the crafts that aim to produce particular and distinctive objects of beauty. Nor is beauty of the essence; the aim may be to produce something of resplendent ugliness or repulsiveness. What is more fundamental is that they are works of skill and imagination. Many of these art and craft forms and activities involve (the production of) works of the imagination which depict objects that, like the objects of fiction, do not exist. A water jug or basket in the shape of a mythical beast or fish depicts an object in much the way that a piece of sculpture or a painting depicts an object (or several objects): an object that does not exist by way of something, some medium, perhaps of a rather different kind, that does exist.[1] The latter is the primary source; secondary sources include details of cultural and ideological setting, historical background, special features of the medium concerned, etc. Museum presentations illustrate both well: for typically both the prime source (the painting, the piece of "primitive" art, etc.) will be on display, and accompanying notes will supply some of the secondary information. Together these supply the material for the source (book) for objects native to the prime source and confined to it. The source books for other imaginary objects depicted differs only in elaboration, e.g. consideration of all the works in case of objects native to several sources, and of material from its native sources for immigrant objects. Such an imaginary object will have, like a fictional object, all the characterising features ascribed to it by its source, and it will be in fact the object with all the features its source attributes it. There will be contexts too, like fictional contexts, where we speak of the objects taking it for granted that they have all the features they are ascribed; in such cases semantical evaluation is ultimately made in the worlds of the objects spoken about. In short, the general theory transfers largely intact to the objects depicted in imaginative works of art and craft. The works of the "especially" fine arts that depict objects do however have the feature that commonly a direct representation of the objects depicted is obtained, so the objects, which can be seen[2] (the main pictorial arts being visually oriented), are often a good deal more determinate than the objects of purely literary fiction which readers must to some extent picture for themselves.

Much music, some poetry and some modern art falls outside this setting in that no imaginary objects are depicted. Poetry, which when it portrays fictional objects belongs strictly with literary fiction, may be nonfictional. Music is often not pictorial, and a modern painting may be entirely formal, simply concerned with the arrangement of shapes. With architecture too, especially modern functional architecture, no objects may be depicted in the final product: with architecture which is symbolic or includes sculpture or paintings it is different.

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[1] As with fiction, an adequate theory of the matter cannot be restricted to primary sources that exist, or have existed, or will exist, though they don't yet.

[2] Compare the usage in which the average Australian TV viewer who has never seen a lyre bird (in the flesh) sees lyre birds; and see further 8.10.

Works of art generally involve both a production stage and a product: the work is in the making. So far we have been largely concerned with the product and with objects depicted in the product. But the process is also of considerable noneist interest (as it was of Aristotelian interest). For the artist is engaged with designs and models and sketches and images of what does not (yet) exist. The artist envisages, and as necessary changes, a product which does not exist (though materials may exist which go into the final arrangement); and, like a builder with whom she may work, is involved in later stages in the actualisation of the object imagined (cf. 1.25)

4. Types of media and literary fiction. There are distinctive features of various literary and media types, mainly connected with their sources, that have not been elucidated. The primary sources of the various types differ significantly in form, e.g. comics, like the films in which they may be presented and like nondocumentary film generally, have a visual component consisting of a sequence of illustrations, balloons or photographic stills. Indeed the form of primary sources is the main feature distinguishing the types. Differences in content or theme are never essential in distinguishing types, though such differences may yield subclassifications, e.g. situation drama, the western, the social novel.[1] Many of the differences in source of the types are obvious, e.g. an opera has as a primary source a score which includes both a libretto and an often elaborate musical score, and it may contain stage and other production directions. Art forms such as opera, masques, plays, ballet and the like that have, unlike novels (unless they are filmed, televised, etc.), both primary sources and performances; they have a similarity set $\{N_i : i \in I\}$ of intermediate sources for I a set indexing the performances and the primary source $N_0 = N$. For each N_i with $i \neq 0$, N_i answers to N_0 and interprets it. The set $\{N_i : i \in I\}$ extends to a cluster of similar worlds $\{a(\underline{\underline{N}}_i) : i \in I\}$ with each N_i $(i \neq 0)$ overlapping $\underline{\underline{T}}$ since the performances occur.[2] Likewise as regards the objects of such art forms there will be similarity sets; for object d of N a set $\{d_i : i \in N\}$ of d together with interpretations by performers, and a cluster $\{S(d_1) : i \in I\}$ of source books for d and its interpretations.[3] Some of the conditions governing

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[1] Somewhat as a scientific theory may succeed, by considering simplified models with idealised nonentities, in explaining what happens in $\underline{\underline{G}}$, so a social novel may make or register its social or moral points regarding $\underline{\underline{T}}$ by looking at suitably arranged situations involving fictional characters where the points can be brought out better or more sharply.

[2] At least tokens of the type do. Difficulties as to types recede on any theory of objects, nonexistent types representing no problem per se.

A work of fiction itself, being characteristically a type determined by certain tokens, is not a particular and does not exist. Thus modern works of fiction contrast with works of art such as paintings or pieces of sculpture or historic buildings or gardens which are particular, though they may have copies.

[3] A rather similar complication of theory may be called for in the case of a work of fiction N which has rival interpretations. Then N may have several elaborations $S_i(N)$ for i in an indexing set J of interpretations. If deletion is permitted (as it may have to be in such cases, e.g. where a literary critic manages to discount certain passages), then an elaboration is not simply an extension governed by material and closure conditions. $\{S_i(N) : i \in J\}$ is like a set of models for a theory N, and will ideally include an intended interpretation $S_0(N)$ (which may not however be known).

similarity and interpretations are not too difficult to formulate. N_i, for $i \neq 0$, must answer to N_0 in including or conforming to it. For example, where N_0 is a musical score and N_i a musical performance of N_0 - to take in yet another art form - then N_i cannot strictly (or at least only to a very limited extent) change the notes or their sequence as shown in N_0. But N_0 will be characteristically incomplete - very incomplete with earlier musical scores, which allow for variations - and leave scope for interpretation within the given scheme by performers. Interpretation and performances are governed not only by N_0 but by what $\underline{\underline{T}}$ permits.

Some literary forms are more heavily constrained by $\underline{\underline{T}}$ than those primarily considered, e.g. legends, sagas, and myths. Legends comprise stories in the tradition of archetypal forms presenting the lives of saints or heroes. They thus have a main character whose life is based on the life of someone who did exist (in Greek "legends" the latter condition may not be satisfied).[1] Let d be such a character and d* the former entity on which d is based. Then almost invariably $d \neq d^*$, since they differ on characterising features. Then typically d never exists: d is an immigrant, a duplicate of d*. To say that d is based on d* is to say that the source book S(d) for d is a variation on the part of the chronicle of the life of d*. Legends are special cases of sagas, which (freed from their original Scandanavian setting) may be tied not to an individual d* but to an historic family or group.

What is distinctive about myths is that they (traditionally) serve or are intended to explain natural phenomena or events or things, i.e. roughly aspects of world $\underline{\underline{G}}$. This is achieved characteristically in traditional stories of narrative type with supernatureal characters, who help in accounting for things. Thus where N is a myth, $\underline{\underline{a}}(N)$ overlaps $\underline{\underline{G}}$ - at least that is an adherent's or insider's view. The non-adherent's or total outsider's view on myths is more or less summed up in the OED definition of 'myth' as 'purely fictitious narrative usu. involving supernatural persons and embodying popular ideas on natural phenomena'. There are significant differences between insiders' and outsiders' treatment of a given myth,[2] differences reflected in their respective (inferential) behaviour, differences we shall see again as regards scientific theories. For myths provide a bridge between pure fiction and theory: myths embody primitive or rudimentary theories.

5. Fictional objects versus theoretical objects, and the mistake of fictionalism. A theoretical object is, crudely, one of the "characters" of a (scientific) theory, of a theory that, in live cases, purports to elucidate empirical reality. Objects of a dead or failed theory behave very like a fictional object, like the objects of myth. Most obviously, theoretical objects belong to some theory while fictional objects are supplied by a work of fiction or the like, not a very hard and fast boundary. To sharpen the contrast, let us restrict theoretical objects to the objects of live theories.

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[1] Epics, which have a given literary form, need not satisfy the condition either. However the basis relation is not exacting; e.g. as regards heroic facts, it matters not that the historical documents of the time make no mention of dragons.

[2] The inside/outside distinction is, like the worlds picture, appreciated in literary criticism. Thus, for example, Tolkein can say of the Beowulf poet: 'he could view from without, but could feel ... from within the old dogma'.

Then theoretical objects are, according to insiders, always deductively closed, fictional objects are sometimes not; theoretical objects stand in entire relations to their own kind and to entities, fictional objects do not. So in particular, with statements concerning theoretical objects, passive conversion is always admissible and frames are commonly extensional and so admit replacement of identicals: many of the contextual intensional aspects of genuine fiction are removed. Insiders operate in these logical ways with the theory and its objects: outsiders are more cautious. The key distinguishing features derive from the intended role of theoretical objects in giving a description and explanation of the empirico-historical world (i.e. $\underline{\underline{G}}$). So too do other distinctive constraints on theoretical objects: that the theories to which they belong are subject to empirical falsification, etc. In marked contrast, the source books of fictional objects are not so subject. Holmes does not have to answer to historical facts. With respect to Holmes we are all (well, almost all) outsiders.

The basic mistake of fictionalism, the thesis of which is that theories are fictions, is that it ignores these crucial differences.[1]

6. The incompleteness and "fictionality" of the theory of fictions advanced. The integrated theory of fictions outlined is like most philosophical theories, rather incomplete. It admits of, and needs, extension; for, as so far outlined, it leaves several important areas open. To take a rather different example from those that will have been evident to the careful reader: though the theory admits of extension, like orthodox semantics it only deals with sentences one at a time, not with whole chunks of discourse at once (the effect of larger chunks can however be obtained, firstly through logical compounding, e.g. by extensional and intensional conjunction, and secondly using context). Of course it is commonly supposed that the theory extends directly from one sentence to several, by the rule I(A·B) = I(A & B), i.e. full stops are evaluated like conjunctions. Davidson's work (e.g. 68) has the accidental benefit of indicating that this assumption - long under suspicion, since for example a book as a whole is not rendered false just because one of its statements is - is mistaken, and not mistaken only where some of the sentences are of non-indicative moods. Consider 'Galileo said that . The earth is round'. In this case the intended evaluation rule is not I(Galileo said that . The earth is round) = (I(Galileo said that and the world is round), but, what it had better be if Davidson's account is to begin to serve, I(Galileo said that . The earth is round) = I(Galileo said that the earth is round).

The theory may also be alleged to be fictional in the philosophical sense. If to include classes of objects which do not exist and whose nonexistence is irreducible under analysis, is to engage in work of fiction, the theory presented is a work of fiction. For in this enlarged - but eminently questionable and rejectable - sense, almost all the apparatus is fictional: the worlds of fiction are "fictions", logicians' "make-believe" so to say, the objects of fictions are commonly fictions, and stand in what may be said to be "fictitious" relations. And like more ordinary fictions sayso determines much of the character of such logicians' fictions, for instance, what has what properties, whether given objects are the same; e.g. we can stipulate (transworld-wise) that a city London with different properties from the actual London of 1977 is the same as the actual one. Once again, neither the purely stipulative nor the purely given accounts of such fictional objects is correct: what is right is a mixture of these accounts. In all these respects, and others, the integrated contextual theory proposed is, in the wide and erroneous philosophical sense of 'fictional', a fictional theory of fiction and fictions.

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[1] The differences are likewise not observed in Bentham and Vaihinger. A brief discussion of fictionalism is to be found in Harré 72, p.80 ff.

CHAPTER 8

THE IMPORTANCE OF NOT EXISTING[1]

An adequate theory of meaning and truth is semantically important. Such a theory necessarily includes in its analysis nonentities, items that do not exist. So what is semantically, and hence logically, important is bound to include nonentities. In virtue of the modifier 'semantically', the first premiss is analytic (it is not analytic that what is semantically important is important, but it is) and it is comparatively uncontroversial By contrast the second premiss of the syllogism, which we want to stick to, is decidedly controversial. So too is the thesis (already advanced and in Chisholm 73) - which implies the inadequacy of classical logical theories - that there are a great many natural language statements, statements an adequate theory should be able to treat of, which cannot be analysed logically, and semantically, without the equivalent of an appeal to nonentities. Defence of the thesis has been somewhat piecemeal, taking the form that all the theories so far offered which try to dispense with nonentities break down or run into insuperable difficulties, difficulties which are readily surmounted given appropriate talk about nonentities. In what follows we shall outline more general sorts of argument for the thesis, designed to show that no theory which dispenses with nonentities as objects of discourse can do justice to the data.

The thesis of the inadequacy of classical logical theory, basically one of Meinong's theses expanded and dressed up in more modern attire, has not exactly won widespread acclaim, but it has gained some notoriety and has encountered much opposition. Much of what follows is a further attempt to counter some of that opposition; to reinforce the claim that classical theories break down irreparably over the analysis of intensional discourse concerning nonentities; to meet the objection that objectual semantics for Meinongian-style theories of objects have themselves serious flaws; to refute the view that Meinongian theories have no philosophical advantages, only drawbacks; and to show, by way of illustration of the importance of nonentities in solving traditional philosophical problems, how the theory of objects, and only such a theory, can resolve many problems, in metaphysics and in epistemology, problems in fact generated by the classical theory.

§1. *Further classical attempts to deal with discourse about the non-existent: Davidson's paratactic analysis.* Theories of descriptions, the main method of replacing "apparent" talk of nonentities by talk of entities, work, not too unsatisfactorily, for a range of rather simple cases. Examples do not have to be much complicated, however, for failure of the theories to become conspicuous, especially when descriptors are combined with intensional functors.

(α) Meinong believed that the round square is round.

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[1] This chapter is, in part, a reply to Smart's critique 77. But it stands on its own, and may be read independently of Smart's worthwhile critique. All page references are, unless otherwise indicated, to Smart's critique.

This is true, but Russell's theory of descriptions, still the best of the theories of descriptions for natural language applications, brings it out as false, whatever scoping is assigned to the description; for it is false that there exists a round square and it is false that Meinong believed that there exists a round square. Other theories of descriptions yield either no analysis, e.g. Hilbert's theory, or a mistaken analysis, e.g. one construal of the fashionable theory deriving from Frege, according to which nondenoting descriptions denote the null set or a null entity or some set-theoretical complication thereof (on the other construal such theories yield no analysis). Since the round square does not exist, 'the round square' accordingly denotes the null set (or etc.). But it is ludicrous to suggest that Meinong believed that the null set is round: similarly with set-theoretical constructs from the null set.

'Classical logicians do have ways of dealing with' such sentences as (α) - so at least Smart contends (p.3) - the best being 'Davidson's paratactic analysis' which transforms (α) to

(αD) Meinong believed that . The Round square is round,

in which 'the second sentence is not asserted, but exhibited so that its *content* can be taken to be what is *referred* to by the demonstrative "that"' (our italics).

Objection 1. A classical logician cannot deal with the proposed analysandum. Firstly, he has no way of formalising the full stop as it figures in such sentences. The classical assumption has been that a full stop is but, what it looks like in the notation of Peano's *Formulaire* and of *Principia Mathematica*, a conjunction. But the full stop of (αD) cannot be rendered in the normal way, as a conjunction. A conjunction entails both of its conjuncts; but (αD) entails neither. Indeed 'Meinong believed that', which is seriously incomplete out of context, and so an odd consequence, would hardly qualify as a classically admissible sentence without some analysis (e.g. Russell's elimination of egocentric particulars).

Perhaps however classical logicians have some other way of coping with such full stop connectives, even if they haven't exactly made the matter public. Really they have no way of coping. Full stop cannot be accommodated in an extensional object language: for it does not permit extensional replacement, i.e. A ≡ B and C ≡ D does not guarantee A.C ≡ B.D. Try, for example, replacing 'The round square is round' by truth-functional equivalents in (αD).

Alternatively observe that a Davidsonian-style analysis can equally be given for a wide range of modal functors, e.g. 'It is necessary that 2 + 2 = 4' becomes 'That is necessary . 2 + 2 = 4'; the result is not extensional any more than the starting point.

Nor can full stop be accommodated metatheoretically in the way that functors such as those of necessity and consistency can to some extent be replicated. For one very evident property of full stop is its iterability. And moreover replacement of logical equivalents is no more permissible in (αD) then replacement of truth-functional equivalents.

Objection 2. What is the object *that* locates in (αD)? The obvious answer, which corresponds to the substitutivity conditions in 'Meinong believed ...', is that the object in question is a proposition or content, namely the proposition that the round square is round. But propositions appeal to classical logicians no more than properties, and are no more amenable to classical analysis. So the obvious answer has once again to be set aside classically. The classically tempting answer, that *that* points out a sentence or inscription,[1] has also to be set aside, as wrong. Meinong didn't believe a sentence. And the substitutivity conditions on sentences are quite different:-

(α) is true iff

(α') Meinong believed the round square to be round, and iff

(α") Meinong believed roundness is a property of the round square,

biconditionals that would fail under a sentential analysis.[2]

Objection 3. According to the *Oxford English Dictionary* it is 'that^2' the (commonly deletable) conjunction introducing subordinate clauses, that occurs in (α), not 'that^1', the demonstrative adjective and pronoun. It is certainly open to question that 'that' functions as a proper demonstrative in (α). For it vanishes entirely under syntactical transformations and under translation. As to the first, consider (α') or the passive transform (which extracts the subject)

(a''') The round square was believed by Meinong to be round.

These do not admit of Davidsonian split. Secondly, Davidson's analysis would fail entirely in Latin where the *that* clause is translated into *oratio obliqua*, along the lines of (α').[3]

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[1] Davidson's theory has certainly been given such a construal by later exponents. For instance, according to Peacocke (75, p.126) the first sentence of (αD) contains 'a demonstrative reference ('that') to an utterance of the second'. On this construal Davidson has exploited the fact (of which he was well aware, according to Peacocke) that quotation marks behave in many respects like (certain) demonstratives. The clever replacing of quotation marks of the earlier more primitive positivist analyses, by 'that' with a full-stop, both brings the analysis closer to obvious English reconstruals, and thereby appears to reduce counterexamples to the analysis. A serious dilemma remains however. Either the second sentence in (αD) is quoted or it is not. If it is, then the usual translation objections of Church and others apply - unless a new theory of quotation, bound to exceed referential resources, is supplied. If not, then replacement of subjects in the second sentence, and quantification into it, are not blocked, and the traditional problems which the (proper) treatment of belief as a relation cause for referential theories remain. The yet-to-be-satisfactorily-provided account of *same sayings* is an attempt to slip between the horns of this dilemma. But without equivocation it can hardly succeed.

[2] A much more elaborate and general objection to sentential-style analyses of belief claims, including Davidson's, may be found in Thomason (77, see p.352). However Thomason's argument depends on some large assumptions, as to the correctness of the classical ways of doing things logically, and especially as to the way analogues of the semantical paradoxes are to be logically treated.

[3] The analysis also breaks down on 'It is ...' constructions, e.g. 'It is said [believed] that A', is not equivalent to 'It is said [believed] that .A'. 'It is said that.' is not a sentence, but only the beginning of one.

Rather the that should be coupled with the object of belief, as examples like the following help show:

(β) Meinong believed Reid and what he said and so that the round square is round.

Try a Davidsonian analysis on (β).

This is not to deny that etymologically 'that^2' derives from a demonstrative. This was remarked by Meinong in his anticipation, by more than half a century, of the analysis now usually attributed to Davidson:

> So far as is known to me, linguists agree that our connective 'that' is basically nothing but a demonstrative pronoun. If one says, for example, 'I believe that what is pure harmonically may be impure melodically', then, etymologically, at least, he is saying nothing other than 'I believe this: what is pure harmonically may be impure melodically'.
> (UA, p.48)

Davidson's main contribution appears to have been, to put it quite uncharitably, to replace a colon by, what is less satisfactory, a full stop.

Objection 4. Davidson's analysis appears, at first sight at least, to break down upon compounding. Consider, for example, earlier biconditionals such as "(α) iff (α')", or, for instance,

(γ) Meinong believed that Meinong believed that the round square is round.

It won't do to rephrase it

(γD) Meinong believed that . Meinong believed that . The round square is round,

because the first 'that' points to the whole remainder of the sentence. Or consider

(δ) Because Meinong believed that the round square is round he believed both that something is round and of something that it is round.

Such examples strongly resist Davidsonian analysis. However with a little ingenuity, a larger amount of distortion, and a supply of demonstratives ('thet', 'thit', 'thot', 'thut' etc. of the positivists), even examples like (δ) can be full stop accommodated, after a fashion. So emerges another dilemma. For if the theory does so admit of extension to compounds, then it would seem to admit much beyond the reach of classical logic, including neutral (nonreferential) quantification. Consider a Davidsonian-style paraphrase of

(κ) Meinong believed that the round square is round; hence for some object, namely the round square, Meinong believed of that object that it is round.

The paraphrase runs:

(κD) Meinong believed that . The round square is round. Hence for some object, namely the round square, the following is true. Meinong believed thot . That object is round.

The Davidsonian analysis licenses quantification over impossible objects; and accordingly is classically inadmissible on this ground also.

Objection 5. Either Russell's analysis or a variant thereof continues to apply or it does not. If it does then (αD) is false since Meinong did not believe what the analysis would have him believe. But if it does not, then the intensional indicator must have the curious property of blocking analysis: the same sentence is analysable or not depending on where it appears as a separate sentence. And then, furthermore, the method blocks the expected analysis of claims like

(ε) The round square does not exist and Meinong did not believe that it did, and

(ϕ) Though the round square does not exist Meinong believed that it was round.

How, in short, is the Davidsonian analysis to be classically combined with a Russellian, or theory of description, resolution of the "riddle of non-being"?

To sum up the objections: while the Davidsonian analysis is open to the Meinongian - and was indeed explicitly proposed by Meinong - it is classically unacceptable.

Is there some other way in which classical logicians can analyse examples like (α)? Not so as to do justice to the range of truths natural language can express. Classical logicians have only a very limited number of devices open to them: either (a) they translate (or paraphrase) statements apparently about what does not exist into statements about what does exist or (b) they block analysis, in the apparent style of (αD).[1] Characteristically the paraphrasing of method (a) involves the replacement of names by descriptors and predicates and the elimination of descriptors by quantificational analysis.[2] Connections such as sameness of subject (or object), as with the subject 'the round square' in

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[1] The third familiar classical method, the platonistic method repeatedly used in classical theories of mathematics, of declaring that all the objects of mathematics, no matter how weird or bizarre, really do exist, hardly bears examination in the case of objects that even more patently do not exist, such as Pegasus and Meinong's round square (even so it is examined in chapter 4).

[2] There are other procedures, though they are scarcely "classical", or even properly worked out, Multiple Reference Theory methods. The most suitable are variations on the Fregean method of translation into the language of concepts, all concepts including inconsistent ones being taken (quite erroneously) to exist. For example, 'the round square necessarily does not exist' translates into 'the concept of the round square is logically empty'. (Theories which take only some attributes to exist, e.g. instantiated ones or consistent ones, do not yield full higher order logics, and cannot provide satisfactory translations in the case of objects whose corresponding concepts do not exist.) Since such Fregean methods amount to translation not into quantification theory but into some higher order predicate logic, they certainly have a better chance of success than Russellian-style methods. Nonetheless, as is argued in detail in 1.7, they do not succeed. Either, as with Frege's own theory, the translation procedure is not uniform, so the methods founder when different sorts of cases are combined; or else, where the translation procedure is uniform,

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(ψ) The round square does not exist but Meinong believed that the round square is round,

vanish into sameness of predicates such as 'is round' and 'is square' under translation. Any such analysis - already in trouble over examples like (ψ) - is bound to fail then when sameness of subject is essential, as in quantificational arguments. More generally, no elimination of type (a) is going to succeed with natural language examples like the following (where 'rs' abbreviates 'the round square'):-

(μ) If rs does not exist and Meinong believes that rs is round then for some object, namely rs, that object does not exist and Meinong believes that that object is round.

Such English assertions as (μ) are grammatical, they are well-formed, without qualification; they make sense, i.e. they are significant; they are readily intelligible at least at the level of common sense; and they admit of simple formalisation in neutral quantification logic. So what is the case for somehow outlawing assertions like (μ) or blocking their analysis? The case-familiar enough in vague outline, if not in detail (e.g. what is the resulting status of (μ): true, false, nonsignificant, ill-formed?) - is at bottom a thoroughly circular one, namely that (μ) cannot be handled by the epicyclic apparatus of classical logic. The objections, from classically engendered modal paradoxes and the like, are easily enough met in neutral logic, by an elementary distinction between extensional identity and stronger intensional identity relations (for details see 1). And surely logical analysis of assertions like (μ) is required. For, firstly, (μ) is well-formed. Hence, by the principle of excluded middle, either (μ) or ~(μ). Either option makes for similar difficulties for classical logicians, so trouble is inevitable classically. As (μ) is classically incoherent, it is false (because all well-formed rubbish has to be put in the false bag, under the category reduction of classical logic). Now consider ~(μ), and let us make things a little easier for classical logicians by supposing that the 'if ... then' in ~(μ) is a material one. Then after classical transformation ~(μ) becomes

(ν) Rs does not exist and Meinong believed rs is round, and for each object if Meinong believed it is round then, materially, it exists.

(ν) is of the form (ψ) & (θ), with (θ), since it involves nonexistential quantification, raising the same difficulties classically as before. Since (θ) is false, (ν) is false, and (μ) is true, contradicting (μ)'s falsehood.

The conclusion is firstly that classical logicians are in very real difficulties with assertions like (μ); and, secondly that (μ) exemplifies an extensive class of natural language statements which express truths which are not classically expressible, and which accordingly no classical

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although there are no truth-value or other failures, the method is entirely unexplanatory. For the success of the uniform method depends on introducing many new technical predicates - parasitic however for preservation of truth-value assignments on the old predicates they are supposed to be eliminating - and when any attempt is made to convey what the new technical predicates are supposed to mean, the explanation is forced back to the meanings of the old, and supposedly eliminated, predicates. In short, the case against uniform concept reduction has much in common with the case against uniform extensional reduction.

epicycling through theories of descriptions is going to admit. The argument also reveals that free logical theories of descriptions (e.g. Hintikka 59, Scott 67, Lambert-van Fraassen 72) are bound to be inadequate. For they cannot treat descriptions as full logical subjects, e.g. they cannot particularise (as in (μ)) on descriptions about what does not exist. In cases where descriptions do not refer, free logic theories have either to refuse analysis (as happens in the weak theory of Lambert-van Fraassen), introduce one or more "null" terms in the replacement range of free non-bindable variables (as, e.g., in Scott's theory) or else dissolve such descriptions by predicate-quantifier analysis in classical fashion. In no case do subjects accessible to logical operations remain, and thus none can succeed where, as in English, non-referring descriptive terms combine with logical operations such as quantification. Such assertions as (μ) are however straightforwardly accommodated within the logical framework of the theory of objects.

§2. *The transparency of neutral semantics.*

> The apparent ease with which a Meinongian position handles referentially opaque sentence contexts and classically problematic intensional discourse is apparent only (cf. Smart p.3).

Really, the objection continues, a Meinongian position has no philosophically satisfactory semantics; for a satisfactory semantics cannot be based on referentially opaque expressions such as 'is about' used to apply to nonentities; it

> must use semantic expressions only within transparent contexts. ... in a satisfactory semantics the relevant semantic predicates, such as 'satisfies' 'is true of' 'about' 'denotes', must be extensional (belong to transparent contexts) (Smart: abstract to 77).

Even if this were true, it would not be especially telling on its own, it is far from self-evident that semantics must be so based to be satisfactory. But in fact the case rests on an extraordinarily common three-way confusion between the following notions:

(i) referential transparency [or its opposite (i*) referential opacity],

(ii) extensionality [or (ii*) intensionality], and

(iii) existential loading, i.e. implying existence [or (iii*) not implying existence].

The following passage illustrates the confusion (p.3):

> It is clear that the Routleys' phrase '"N" is about ...' is an intensional, or what Quine would call a 'referentially opaque' context. Similarly the phrase 'Richard talks about ...' is referentially opaque. 'Richard talks about Pegasus' does not imply that Pegasus exists, in the way that 'Richard kicks Pegasus' does. It is this referential opacity or intensionality of 'talks about' which gives Meinongian semantics its apparent advantage ... .

It is important to bring out the confusion, because it will then become clear that it is not so clear at all that the phrase '"N" is about ...' is intensional or opaque.

(a) Existential loading does not imply extensionality. A simple counterexample to the implicational thesis is 'Tom knows that a white rhinoceros exists' which is existentially loaded but not extensional.

(b) Extensionality does not imply existential loading. 'Pegasus does not exist' is extensional but does not carry existential loading. Similarly for many negated statements: because on the orthodox (Brentano) view it cannot be the case that Richard kicks Pegasus, "It is not the case that Richard kicks Pegasus" is true, but it is an extensional truth which does not imply Pegasus exists.

(c) Existential loading does not imply referential transparency. Consider again intensional success functors, e.g. 'Tom finally observed that the opera house was finished', 'John knew that his father still existed somewhere'.

(d) Referential transparency does not imply existential loading. Consider again 'a does not exist', or Wittgenstein's 'NN is dead'. '... does not exist' is transparent but does not imply existence.

The interconnections of extensionality and transparency are more troublesome. An initial problem in making a comparison is that the modern extensional-intensional distinction - a distinction, which goes right back through medieval philosophy, and was introduced into modern logic by Russell in only one of the many interrelated traditional senses - applies directly only to statemental functors: specifically Φ is extensional iff for every p and q, if $p \equiv q$ then $\Phi p \equiv \Phi q$. By contrast, the transparency-opacity distinction, also introduced by Russell, applies in the first instance to predicates: in the one-place case f is transparent iff for every x and y if $x = y$ then $f(x) \equiv f(y)$. There are of course predicates which apply significantly both to propositional and individual subjects, e.g. 'was in fact heard by Charlie', which is intensional but transparent, the modifier 'in fact' serving to render the predicate transparent. There are various ways of trying to knit the distinctions together, most of them unsatisfactory, beginning with the Carnap-Quine procedure of taking transparency to define extensionality in the predicate case: but the problems of amalgamation[1] are hardly a present concern since critics of the Meinongian venture such as Smart follow Quine in equating extensional with transparent in the predicate case (e.g. 'extensional (belong to transparent contexts)', abstract to 77; and 'intensional, or what Quine would call a 'referentially opaque' context' [2]).

It has been urged (especially by Smart) that 'a philosophically satisfactory semantics must use semantic expressions only with transparent contexts', though substantial reasons for the thesis remain, as we shall see - like substantial reasons for the Lesniewskian thesis of extensionality - rather opaque. It is a little surprising that the truth of the assumed transparency thesis should be taken to be a major objection to Meinongian semantics. For the basic semantical predicate '"N" is about ...', or a variant thereof such as '"N" names ...', is transparent, and indeed extensional in a good semantical sense, namely its semantical assessment involves no world shift. There seem to be two reasons for the assumption that the basic predicate is opaque. Firstly, there is a confusion of 'is about' with 'talks about'. To say 'the winged horse' is about Pegasus is not to say 'the winged horse' talks about Pegasus. 'Talk about' is presumably opaque: George IV talked about the author of Waverley does not have the same truth value, in certain famous contexts, as George IV talked about Scott. 'Is about' is however not opaque: 'is about' does not differ from 'is in fact about'. And generally, whenever x = y, if 'N' is about x then 'N' is about y, for all objects x and y, and so, by restriction, for all entities x and y. This transparency can moreover be proved; for 'N' is about x iff N = x; hence proof of transparency follows from transitivity of extensional identity. Secondly, transparency has been confused with existential loading. While the predicate '"N" is about ...' is transparent, it is certainly not (in the intended sense) existentially loaded, since, for example, the truth "'Pegasus' is about Pegasus" does not imply that Pegasus exists.

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[1] These problems are studied, in a somewhat different setting, in Slog, p.620 ff.

[2] Really this is back-to-front; it should be: referentially opaque (in Russell's sense), or what Quine would call 'intensional'. As to Quine's sense, see FLP.

§3. *Proposed reductions of nonentities to intensional objects, such as properties and complexes thereof; and some of their inadequacies.*

> ' 'Pegasus' is about Pegasus' means that 'Pegasus' is about the property of being a winged horse. Talking about unicorns is talking about the property of being a one-horned quadruped (pp.4-5).

Let a be any winged horse. Then on this account 'a' is about the property of being a winged horse, whence Pegasus = a. So there is at most one winged horse, namely Pegasus: this is evidently false. For consider the same argument in the case of Chiron and other centaurs: we know there were several centaurs. There are two ways out of this sort of difficulty:

(i) Introduce instead properties of particulars, e.g. the property of being Pegasus, or, in Quine's fashion which eliminates 'Pegasus' as a singular term altogether, the property of pegasizing.

(ii) Associate with Pegasus a set of properties. This is what Parsons does (in 74). Smart conflates (i) and (ii) (e.g. p.5: 'Terence Parsons has worked out this sort of account [viz. (i)] in some detail ...') though they differ, since a set (of several properties) is not a property. Parallel objections do apply however to both proposals: commonly objections to (i) may be transferred to apply against (ii).

It follows from (i) that

(a) 'Pegasus' is about Pegasus iff 'Pegasus' is about the property of being Pegasus, i.e. of pegasizing; and thence that

(b) Pegasus = the property of pegasizing, e.g. as follows:

'Pegasus' is about Pegasus iff I(Pegasus) = Pegasus and 'Pegasus' is about the property of pegasizing iff I(Pegasus) = the property of pegasizing, whence transitivity of identity yields (b).

Objection 1. (a) and (b) are false. For Pegasus and the property of pegasizing have quite different properties. For example, the property of pegasizing is a property, but Pegasus is not a property; Pegasus is a fabulous winged horse but the property of pegasizing is not a fabulous winged horse; and so on. Thus in talking about Pegasus one is not talking about a property at all.

A similar objection would apply against Parsons' modelling had he equated Pegasus with a set of properties;[1] but in the modelling Pegasus is only represented by, or correlated with, a set of properties. How objectionable the account is depends on what features transfer across the correlation. As it happens enough damaging features do transfer. For a functional relation is assumed in effect: thus, for instance, Pegasus = $(\{\text{nuclear } \underline{p}\colon\ \underline{p}(\text{Pegasus})\})$, where f is the correlating function. The equation is only good for a limited class of cases, and cannot afford a general reduction - quite apart from its circularity, i.e. the properties of Pegasus are determined as those of Pegasus. For consider a statement such as that Bellerophon wondered whether Pegasus would fall under him in the battle with the Chimaera: Bellerophon was not wondering whether a function (i.e. set-theoretically, a class) of a class of properties would fall under him, and if he had, per impossible, been "riding" such an object he would hardly have fared so well in the battle with the Chimaera.

More generally, Parsons' representation (in 74) of the nonexistential existentially (in terms of an ontology of properties) is like the representation of the nonextensional extensionally. Both may be unproblematic for limited purposes,[2] but neither show eliminability. In the intensional case intensionality is pushed down into (unanalysed) worlds, in the existence case into sets of properties (involving worlds again), which, even if they are claimed to exist classically, do not really exist.

A main motive (Smart's motive) in trying to reinterpret apparently straightforward Meinongian claims, as that 'Pegasus' is about Pegasus, falsely in terms of their being about properties or sets thereof is, allegedly, to bring out the hidden ontic commitments of Meinongian positions (p.5). Thus Smart's crunch: 'I say that the Meinongian is committed to an ontology of properties' (p.7), i.e. he takes properties to exist.

Objection 2. The existentially-loaded equations and modellings of (i) and (ii) thus interpreted assign to nonentities features they do not have, and that Meinong would certainly have rejected, worst, they assign existence. For the predicate 'exists' is referentially transparent, i.e.

(c) if x = y then x exists iff y exists. Hence by (b),

(d) Pegasus exists iff the property of pegasizing exists.

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[1] It does thus apply against Grossmann 74.

[2] Parsons' is presumably the far more limited, the modelling encountering serious difficulties even with relations, cf. his 74. The assessment of reductionist theories of nonentities, such as Parsons' theory, is continued in chapter 12.

But the property of pegasizing exists, according to the critics; hence Pegasus exists. Similarly consider Parsons' modelling, since functions (being classically sets) exist, Pegasus exists. But Pegasus does not exist and never did exist: on this at least Smart and Meinong agree (cf. p.4: 'there is in the universe no Pegasus').

The conclusion again is that neither (i) nor (ii) is adequate - so long as properties are assigned existence. But need they be? The supposition that because they are talked about they must exist (somehow) is just a variant of the Ontological Assumption, and gets rejected for the same reasons. Smart's assumption (p.7) is that once Meinongian semantics is "repaired" in way (i) or (ii), or similar, it will use predicates such 'is about', 'denotes' and 'satisfies' in a referentially transparent way, and will accordingly imply the existence of the items it is about, namely under the repair, properties or sets thereof. This is fallacious, as we have seen, since transparency does not imply existential loading.

Suppose instead Smart insists (as he certainly seems to, p.7) that basic semantical predicates must be existentially loaded. This is to concede to himself what is at issue, to strip Meinongians of basic semantical apparatus for their theory. However Smart does produce a reason for his insistence, a reason Smart and empiricists generally take to be of great importance, namely (p.7)

> The business of semantics is to say how language hooks on to the world, and a referentially opaque [strictly: existentially unloaded] expression doesn't fill this bill.

This is no reason for the restriction. A Meinongian semantics can do all that a classical semantics does, and much more. A single definition makes this plain:

'a' refers to b $=_{Df}$ 'a' is about b and b exists.

Then 'refers to' is existentially-loaded and can do the classical work of "hooking language onto the world", i.e. of relating words to entities. In fact, of course, this is only a small part of the business of semantics, which has as its larger task something quite beyond classical resources, namely giving an account of meaning, synonymy, and the like.

The attempt, even by sympathetic critics like Smart, to load Meinongians up with ontological commitments usually indicates a failure to understand the Meinongian position, a failure which arises because they bring with them their own ontological baggage.[1] Just this happens in Smart's critique. For example, he assumes that 'less than', which he is prepared to admit as a paradigmatically satisfactory predicate, is existentially-loaded. Yet less than relates numbers,[2] as in "the number of entities is

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[1] Of course, the failure just may indicate something else, e.g. things seriously wrong with all Meinongian theories, but this has never been shown, and now seems increasingly unlikely.

[2] Less than functions in ways other than as a direct relation of numbers, as e.g. in 'What Parsons says is less than the truth', 'What exists is less than what can be thought about', 'That amount is less than I asked

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less than the number of numbers", objects which do not exist according to the Meinongian. More generally, Smart simply assumes, what the Meinongian would dispute, that abstract items such as sets and numbers all exist. That he has lost sight of the Meinongian position comes out clearly in his claim (p.7): 'One has to be a nominalist to deny that integers exist, and so the "non-entities" in the model would exist all right'.[1] One doesn't *have* to be a nominalist to do this: Meinongians too deny that integers exist and that sets exist (as Smart had realised on p.3). This does not entail that they deny that numbers can be less than one another, for example: they simply deny Smart's claim (p.8) that for *x* to be less than number *y*, *y* must exist. In the end Smart frankly admits that he can't understand '...an interpretation or a model which contains among its elements nonentities themselves' (p.7). He wants to say that 'nonentities would have to exist in order to be constituents of the model' (p.7). Why? There is nothing unintelligible about sets of nonentities, which is pretty well all the modelling requires. Isn't it clear that the set *e* = {Pegasus, Chiron} has two elements and so it is not null, i.e. $e \neq \{\ \}$, that e is a proper subset of the class of mythological objects, and so forth? That *e* $\cup$ {the Chimaera} = {Pegasus, Chiron, the Chimaera}, etc.? All this is easily accommodated in the New Math, and could be taught at primary school along with elementary physics dealing with frictionless surfaces, perfectly smooth balls, etc. Such nonentities *do* have important explanatory roles, both in semantics and in applied sciences.[2]

The sort of way in which nonentities can be explanatory will be familiar to anyone who has carefully studies the kinetic theory of gases or black body radiation or who has worked through applied mathematics problems which use models which substantially simplify from the complexities of problems set in the actual world in order to render the problems mathematically tractable. Though familiar, what happens in the final stages of such approximations, when quantitative properties are transferred from nonentities to the real world entities they represent, has of course not been satisfactorily

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for'. 'Less than' commonly functions in an existentially-unloaded way, and not merely as relating numbers, e.g. "the amount of bullshit in Heidegger's philosophy does not exceed that in Quine's philosophy" does not entail that amounts of bullshit exist. Nor, for that matter, are all occurrences of relations like Smart's kicks, Brentano's rode, and Wittgeustein's hangs, existentially-loaded. For example, that Bellerophon rode Pegasus does not entail that Pegasus existed.

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[1] Smart's suggested arithmetic model, with 'the set of prime numbers as the set of actual individuals, and the set of squares of prime numbers as the set of nonentities', is inadequate. For Meinong rightly held that there are more nonentities than entities. Furthermore no arithmetical model is going to be adequate to model all nonentities (even if it can, by a generalised Skolem-Lowenheim theorem, serve to model all usual formal language discourse concerning such objects). For there are more than denumerably many nonentities. If the real numbers themselves won't show this, consider what corresponds, all Wisdomian abracadabras. Such a beast, which lives for an infinite time, has on its forehead a space which always shows a digit (from 0,...9) and these digits keep changing. By Cantor's diagonal argument, the number of Wisdomian abracadabras is non-denumerable.

[2] Smart wants to deny this; thus, p.8: 'Nonentities can't be *explanatory* in the way in which entities can'.

described by classical accounts of explanation. But the important point for our purposes is that such explanations, of the quantitative behaviour of entities in terms of comparable behaviour of nonentities, can occur (even on classical perceptions) because the explanation relation is intensional, and so can relate nonentities to entities. That explanation is intensional can be seen even from rudimentary accounts such as the covering-law theory where a basic relation is an intensional one, namely that of deducibility.[1]

§4. *Theoretical science without ontological commitments.* But science and mathematics need a great many entities, entities such as numbers and Newtonian particles whose existence the Meinongian now appears to be denying. The objection embodies yet another version of the Ontological Assumption: that what the true statements of science and mathematics are about must exist. There is no other "need" than that of retaining this eminently rejectable assumption - the rejection of which brings much philosophical relief, since ideal objects present a serious problem for the (realist) philosopher of science. Without the assumption the obvious can be said: namely that such ideal objects do not exist but they can nevertheless fulfil an explanatory role. It is the same with the perfect objects of mathematics, whether science "needs" them or not. Likewise avoided is that anomalous position of empiricists such as Quine who, wishing to minimize their ontological commitments, say that the only sort of reputable mathematics, that we need to believe in, is that required by science.[2] Much of modern mathematics, most of intensional and intuitionistic mathematics, some even of classical mathematics, is bound to be "removed with the rubbish" under Quine's only-what-science-needs test for mathematical decency or respectability.[3] There are some rather obvious difficulties about this new suggestion. Finding out what is needed or essential in complex mathematical arguments is not a straightforward matter or even effectively determinable. Minimisation of assumptions is a very tricky business. Suppose, for example, that the postulates for analysis can be significantly weakened as far as the proof of every result used in physics is concerned. (Take all principles used in physics and Craig-axiomatise: the result could well be a weaker theory than classical analysis.) Then in adopting full classical analysis the logician is adopting what is false, since it has false, i.e. physically-unrequired, parts. Truth of the end result will not be affected of course since a route to truth may well circuit through falsehood.

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[1] Fuller accounts of explanation and approximations are central to the noneist philosophy of science sketched in chapter 11. The intensionality of explanation is fundamental in explaining how theoretical sciences, which are primarily investigations of certain sorts of nonexistent objects, can account for what actually happens.

[2] It may be extensionalists also realised that there can be, and increasingly will be, intensional mathematics, discourse in the former heartland not conforming to extensional standards of intelligibility.

[3] Intuitionistic analysis, for instance, is not used in science; so it presumably gets removed with the rubbish. How much, one wonders, of Quine's Mathematical Logic and Set Theory and Its Logic escape removal?

> It would be shocking to say that mathematics is false because mathematics, unlike fiction, is an essential part of science (p.4).

It is not difficult to see exactly how much of this claim to agree to: If A is essential for B and B is true, then A is true. Thus the parts of mathematics that are essential for the true parts of science are true. On Smart's view, false parts of science, the wealth of mistaken theories, are not really part of science. And as far as the rest of mathematics is concerned it might just as well, from this perspective, be false. And that may be most of mathematics - how much is uncertain, nor can we generally be certain that we are not working, in doing applied mathematics, with what is false. But what we can be confident of is that some parts of mathematics (e.g. the algebras of certain relevant logics or other esoteric algebras) are never used essentially in true science. So some of mathematics is false. But if some of mathematics is false then mathematics as a whole is false. It is shocking, but it emerges from the Quine-Smart view:

> We should, following Quine, believe in [just] as many objects as are needed for scientific explanation, including the ones which are postulated by that much of mathematics needed for science (p.9).

'Believe in' means here 'believe to exist', and we should believe to exist what true mathematical and scientific statements are about. Nothing else exists, so statements purporting to be about such are (unless analysed) false; and this includes statements of parts of mathematics not essentially used in science. Mathematics is, in (large) part, mythematics, and many mathematicians should be in the Department of Myth which is what the Department of Math becomes on Quinean perceptions (cf. Quine on Math as myth; FLP, p.18).

The Quine-Smart dictum and its shocking consequences are easily avoided on a noneist theory. For the dictum takes it for granted that what objects occur essentially in genuine explanations of scientific truths exist. This assumption is, again, but an extended application of the Ontological Assumption, and likewise false. Ideal objects which do not exist may very well figure in rather satisfactory explanations of scientific truths. So may neutral mathematics which carries no commitment to the existence of mathematical universals. In a similar way the shocking consequence of bringing mathematics as a whole out as false is readily avoided: it is almost[1] enough to say that mathematics has been mistakenly formalised classically, notably in terms of existentially-loaded quantifiers.

§5. *The metalogical trap, and who gets trapped.* Can a Meinongian be trapped into using a classical meta$^{(n)}$-language somewhere up the language hierarchy (Smart hopes so, p.8)? The short answer is, No - unless the Meinongian is stupid and makes mistakes. A longer answer is bound to distinguish sorts of Meinongians, in particular consistent Meinongians from paraconsistent Meinongians. A consistent Meinongian can include all classical theory within his theory, a paraconsistent Meinongian cannot (cf. RLR). A consistent Meinongian need never restrict himself to a classical meta$^{(n)}$-language, for he can always include such a language in a wider framework with more comprehensive quantifiers: if he found a need to say something classical, he could say it in his own language using existentially (and identity) restricted quantifiers. A paraconsistent Meinongian may appear to be in more trouble, since he cannot accept all classical reasoning, and yet may appear to need it, or to illegitimately use it, at certain points in his arguments. He can, however, typically escape criticism of this sort by claiming that he is relying at such steps on an over-arching consistency assumption, which is classically presupposed anyway (see RLR, 3.3). A paraconsistent Meinongian will of course aim to dispense with the usual object language/meta-language distinction, and certainly with hierarchies of languages: a simple inclusion and overlap picture is used instead, and some languages, e.g. English, will furnish their own metalanguages.

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[1] Really a more complicated story needs to be told: for a beginning on this see chapter 11.

These points begin to bring it out that what is going to cause trouble for Meinongians is not language at all, but logical issues such as classes of arguments admitted under given conditions. Meinongians are indeed at a considerable advantage with respect to classical theorists because they can take over, without all the problems that arise for classical theorists, much of English as their ultimate metalanguage: the nonclassical quantifiers of English are no problem, but an asset.

Smart's trap, it thus turns out, is really a trap for the classical logician. For insofar as he uses English or some other natural language in his meta$^{(n)}$-language he may well be exceeding classical resources. An example is Smart's projected treatment of fiction in terms of pretence (p.4): for 'it is pretended that' is an iterable and quantifiable-into highly intensional functor whose proper semantical analysis lies, like that of belief, beyond classical resources.

The many serious difficulties would be more apparent had classical logicians made some proper attempt to explicate some of the notions they have tried to hide away unanalysed in the classical metalogical attic; e.g. the business of accounting for the occurrence of iterated intensional functors such as those of entailment and probability, and of quantification binding variables covered by such functors (these problems for classical theory are considered in some detail in the final section of Routley 74a).

§6. *Alleged grounds for preferring a classical theory.* Unlike many critics of Meinongian enterprises, Smart admits that there is no decisive criterion for choosing the sort of theory he champions over a Meinongian theory,[1] but at the same time he claims preference for his own theory, first, on the basis of the restriction of any philosophically satisfactory semantics to relations like kicking (p.8) and, second, because his theory involves hard work and honest toil as opposed to Meinongian theft, i.e. obtaining solutions to problems too easily (e.g. p.3). The first ground fails to provide a theory-independent ground for choosing between the theories, that is, a criterion which both parties could accept in principle, since a Meinongian would not accept that such existentially-loaded extensional relations as kicking^E are satisfactory paradigms for basic semantical relations, and would in fact regard unloaded intensional relations as thinking and being thought about as in no way inferior and not in need of reduction. In short, the use of such a criterion is question-begging from a Meinongian point of view. Nor can the choice be made in favour of the existential-extensional-relations-only position on the basis of simplicity and economy, since while it may be true that such a position puts less in, it also correspondingly gets less out. So economising on ingredients gives an inferior outcome with much less scope of application in the formalisation of discourse. Compare a one-powdered-egg cake with the much richer result of beating up a three-fresh-egg cake: choice is hardly to be made in terms of simplicity and economy where results are so different (cf. the more detailed argument of Brady-Routley 73).

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[1] The concession is by no means as generous as it may at first appear. For Smart sees Meinongianism as wrong but irrefutable in the same sort of way as dualism and libertarianism. For Smart's conception of philosophy as depending in part on merely plausible considerations, because of the (alleged) inconclusiveness of philosophical argument, see 63, e.g. p.13.

The second ground - acclaimed honest toil - amounts to preferring a theory which has difficulty accounting for some of the data in a straightforward fashion, and which must rely on reinterpreting it or recasting it in a way at variance with its apparent content (and even truth), to one which can provide a straightforward account without distortion of such basic data as that it is possible to make a variety of true statements which are ostensibly about items which do not exist. It is certainly true that the more devious theory may involve more hard work, but that hardly shows its superiority, any more than the fact that it is hard work to try to make something with inferior and badly maintained tools (e.g. a hopelessly blunt saw) shows that this is a superior way of going about making something to using appropriate and well-maintained tools which produce a better result with more ease.

In fact the preference for the more "hard-working" approach in such a case is not only perverse, but involves methodological unsoundness. Suppose for example that we consider two theories about the movement of physical bodies. One succeeds in explaining the data about the movement of such bodies people ostensibly observe in a straightforward way, the other fails for a certain class of such data, predicting that bodies in certain circumstances will fall down when in fact they appear to observers to move upwards. The second theory however adopts strategems for discounting such apparent observations, introducing a further complicating secondary theory which explains such apparent observations as illusions, or in the way perhaps that the Ptolemaic theory of planetary motion attempted to explain deviation from the predicted circular motions of the planets by introducing epicycles. The latter theory of course would be harder work, but there are surely good methodological grounds for preferring the more straightforward theory, which can easily account for the apparent data in a simple way without having to resort to measures for explaining it away or denying that people see what they think they see. In the same vein modern empiricist theories, such as the Quine-Russell theory and its variants, try to persuade people that much basic data about what they ostensibly say, and say truly, about the intensional or non-existent should be ignored or discounted as "obscure" or "unclear", as don't-cares or can't-be-bothereds, or else seen as some kind of pathetic pre-analytic illusion, for example as "systematically misleading expressions", and recast in a rather non-obvious way which fits the theory but not the facts. There are good methodological reasons then for preferring a direct analysis of statements apparently about nonentities, given that such analyses are in other respects adequate.

There is then 'no disturbing impasse here which needs to be resolved' (p.9). There is a clear choice between the different types of theories. The choice is made, once the data is determined, primarily in terms of adequacy to account straightforwardly for the data; and the rival empiricist theories are simply inadequate to cope with this data. Their inability to do so provides independent methodological grounds for preferring a Meinongian theory to every one of them (whether of the Russell, Quine, Davidson or whatever, variety).

It is helpful in sketching out this case to distinguish between hard and soft data (cf. Parsons 75). Hard (or determinate) data must be accounted for by any theory accounted adequate and is independent of theory,[1] while soft (or less determinate) data is not independent of theory, will be construed in different ways by different theories. Differences on soft data do not count against a theory or provide grounds for conclusively rejecting one in favour of the other. Failure to account adequately for the hard data though does provide conclusive reasons for rejecting a theory, or for preferring one which accounts better. (The strategy of Feyerabendian relativism of course is to try and represent all data concerning a theory as if it were soft or theory-relative - the argument for this almost invariably being the resoundingly invalid one that some of it is soft. The examples offered only tell against a rigid empiricism according to which all data is hard. But it is not an all-or-nothing matter: some data is hard and some is not.)

Logical theories are not exempt from having to measure up to hard data standards, and the sort of data which adequate theories must be able to take account of is usually provided by the statements which can be made in natural language with a certain truth value, meaning, point and force, and so on. At least some such data is hard (e.g. that it is sometimes true to say 'I am thinking about Pegasus') even if there are other, perhaps quite extensive areas, which need not be invariant under analysis. The hard data includes not merely statements, of various types with determined truth values, but the admissibility of various operations, such as the extraction of subjects, passive transformation of sentences, etc. A logical or semantical theory which does not do justice to the hard data provided by natural language, which brings out statements which ought to be true as false, or which destroys or changes their meaning, point, or force in a significant way, is just as inadequate as a physical theory which cannot account for observable facts about the world, which implies that a body will move up when it moves down. Of course just as in other areas, a popular ploy used by those who wish to retain a theory which looks like foundering on the rocks of hard data, is to attempt to represent the particular hard data in question as soft, or perhaps to suggest that there is no distinction anywhere between the hard and soft, or in some other way to persuade us that we should ignore, overlook or discount such inconvenient facts. These theory-saving tricks are as prevalent in logical and semantical theory as in other areas.

Thus it is not just that any theory which depends upon construing statements ostensibly about nonentities in a devious and indirect fashion as being about something other than what they appear to be about, e.g. as about everything which exists, must be regarded as inferior on methodological grounds, or because it is unnecessarily complicated and indirect; it is also that no such theory can provide an adequate account of an important class of statements whose truth and point is a matter of hard data. Consider statements of the form 'a does not exist but I ϕ it (him, her)' where ϕ is an intensional relation, perhaps a propositional attitude or a perceptual relation, e.g. 'Pegasus does not exist but I can think (am thinking) about him'. It seems a matter of hard fact that such statements are sometimes true, and that the whole point of the contrasts such statements make depends upon attributing two contrasting properties to one and the same item, Pegasus. That the point of the statement is to contrast two properties of the one item is indicated by the use of the word 'but' in English, and that these contrasted properties are seen as applying to the one item, is indicated by the use of the agreeing pronoun, 'him'. But this means that no theory which relies on either an indirect construal of the first nonexistence claim (so that Pegasus is no longer the subject) or upon preventing analysis of the second intensional statement so that it attributes a property to Pegasus, (or both, as indirect theories usually now do) can possibly be adequate to capture the meaning and point of this type of statement. Accordingly no such indirect analysis can be adequate for the class of hard facts as presented in natural language statements.

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[1] Hard data is a constraint on optimisation in choice of best theory (cf. RLR, chapter 15).

Indirect analyses in fact face a dilemma over such statements, for a standard Russellian analysis applies existential and extensional analysis inside the intensional context, leading to such obvious misconstruals of our statement as "Everything which exists is not Pegasus but I can think that it is not the case that every thing which exists is not Pegasus (i.e. that Pegasus exists)", which is not even adequate to preserve truth. The currently popular Quinean and (slightly more liberal) Davidsonian alternative to this, that of refusing to allow analysis inside the intensional contexts, is perhaps able to maintain the truth of such claims, but at the expense of destroying the point and force of such statements through treating the second part of the statement 'I am thinking about Pegasus' as an unanalysable whole having no connection whatever with the first part. Such a "solution", moreover, creates difficulties even for claims concerning entities, as, for example, in 'The girl was crossing the road but the driver failed to notice her'. When analysis inside intensional contexts is blocked and extraction of intensionally located subjects is refused, much of the point of such statements is lost, and any prospect of such statements' fulfilling their normal roles is sacrificed. How could such an unanalysable intensional statement, in which not only the contrast but the connection between the two parts is lost, fill any sort of explanatory role? How for example could it explain why the driver ran over the girl? It might just as well be 'The girl was crossing the road and the driver thought it was a nice day'. Many important features of intensional discourse disappear on the no-analysis view. If no analysis, then no connection: the connection comes from having the same subject in both parts. No connection, no contrast, no causal link - all these defects are due to referential inability to treat the subject of an intensional statement as what it appears to be and to apply logical analysis within the intensional context. To suggest that such an analysis-blocking approach is adequate for ordinary discourse is like claiming that an adequate inventory of the world can be made from photographs taken from many miles up; the results may be useful for limited purposes, but they can give no idea of the real nature of much of the world and its contents, of the richness, variety and importance of

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[1] As we have already seen in some cases, e.g. quantification and opacity.

its less grossly obvious feature.

At the same time a series of bogus philosophical problems is generated by indirect theories which translate out or refuse access to the objects of intensional discourse, i.e. which treat the ordinarily apparent subjects as not subjects at all, e.g. the so-called "problems" of quantifying in, of opaque contexts, of mass terms, and in a slightly different setting, of transworld identity. Most of the problems are only problems for particular theories; they are not problems at all outside the confines of the theory, e.g. in the case in hand, a referential theory. The "problems" cease to be problems on alternative theories which admit direct analysis such as Meinongian theories.

In summary, theories that rely on such indirect analysis of ordinary intensional discourse must either provide the wrong truth values or else destroy the point and meaning of the statement through refusing a logical analysis which it is essential to make. Either way such an approach runs up against hard data, for the fact that 'Pegasus does not exist but I can think about him' can be true, and that it derives its point from attributing two contrasting properties to a single item, seems a completely firm piece of data.

Both the indirect analysis of non-existence claims and the associated method of disallowing analysis within intensional contexts rely upon setting aside or refusing consideration of a large and important class of hard data statements. The theories are essentially inadequate outside a very limited range of extensional existentially-committed contexts, and are inadequate to provide for the logical treatment of a very large part of natural language. Unless supplemented they lead to a vast impoverishment of expression.

Instead of recognising the limitations of such theories, however, adherents attempt to write off that class of statements or facts with which the theory cannot cope or for which it brings out the wrong results - in effect employing the theory itself as a criterion of what is "admissible" or can "rationally" be said, or of what really counts as worth bothering about. This is a prime piece of theory saving, and amounts to placing the maintenance of empiricist dogmas (for example that all relations should be like 'kicks^E') ahead of the hard data presented by what can truly and pointfully be said in natural language. Such illiberal empiricist theories, which typically congratulate themselves on the scientific nature, economy and hard-headedness of their approach, in fact turn out then to rely on the worst sort of methodological hocuspocus, on theory saving, on ignoring inconvenient bodies of hard data, on introducing subsidiary complicating theories (new epicycles), which attempt to account in an unsatisfactory way for a small part of the mass of unaccounted-for data - data which the allegedly unscientific rivals, such as Meinongian theories, can accommodate with comparative ease.

There are, in short, weighty reasons, both data-based and methodological, for favouring direct Meinongian analyses over classical empiricist alternatives.

§7. *The importance of the nonexistent in accounting for the existent.* The reasons for adopting a theory of objects include not only its ability to account for the hard data concerning statements about nonentities, but also the fact that such a theory makes it possible to avoid various problems concerning the actual world and about entities, and to give a more sensible and commonsense account of the actual world. For what one says about the nonexistent affects in crucial ways what one says about the actual world: they are not independent. The classical war against nonentities is not just a defensive action against the ghostly armies of the nonexistent which leaves what is said about the actual world otherwise untouched: the defensive action has a way, as defensive actions do, of carrying over into and affecting, in quite drastic ways, life within the fort. There are several areas where the carry over is important, e.g. the theory of universals, epistemology, value theory. A corollary of this is that logical issues are not merely esoteric haggling but have important repercussions on the rest of philosophy, on metaphysics and epistemology for instance, as the examples to be sketched will show.

Thus the claim, made for instance by Parsons (75, p.73), that there is no difference between a Meinongian theory and its rivals as regards existents, that differences only emerge concerning what does not exist, is seriously mistaken. Indeed Parsons thereby gives away one of the main reasons for adopting a Meinongian theory - which is not merely the vastly more satisfactory account of intensional phenomena it allows - but that it enables a much more satisfactory account of the actual world, of what exists and is known to exist. There are two important sources of differences between what the rival theories say, and can allow for, concerning the actual world.

Firstly, because he is not forced by the Ontological Assumption to say that certain items he talks or thinks about exist, the Meinongian can, and typically does, operate with a much sparer and more economically populated universe of existents than rival theorists. Despite all the jokes about overpopulated, teeming universes, ontological slums, metaphysical extravagance, and so on, a genuine Meinongian is in fact very much more economical with respect to what really matters - existence assumptions. Thus he is not obliged - just because he wants to retain, among many other things, the small part ordinary discourse an empiricist would consider respectable, such as some mathematics - to say that such items as sets and functions (and perhaps properties) and so forth exist in some mysterious platonic fashion. Unless essential areas such as mathematics and much of science are given away entirely, theories operating with the Ontological Assumption are always forced into some greater or lesser degree of platonism. The Meinongian is often (quite mistakenly) accused of holding a "metaphysical" doctrine which involves strange objects, mysteriously existing or subsisting. But in fact what the platonist is forced to say exists in order to retain even doubtfully adequate shreds of true discourse involves him in an ontology far more mysterious than that of the Meinongian. The Meinongian, on the other hand, can obtain all of these things and more with a commonsense ontology in which what exists are particulars which have concrete existence in space and time, essentially, that is, he can take account of more but assume less. He gets more miles (of true discourse) to the gallon (of existence assumptions) and as well avoids the mysteries of platonic existence.

Secondly, there is an important difference between the rival theories which is usually missed. There is a spillover from the theoretical treatment of nonentities into what one says about entities because the theories give different treatments of the intensional, and intensionality is something which applies to what exists as well as what does not exist. Intensionality is an - perhaps the - important bridge which connects what is said about the nonexistent with what is said about the existent. For the intensional can relate the existent and the nonexistent: the objects of true intensional relations need not exist. The treatment of nonentities has a crucial bearing on the treatment of intensionality, and the treatment of intensionality in turn has a considerable bearing on what is said about the actual world, about what is observed, believed, valued, and so forth.

In fact the treatment of intensionality is critical to many philosophical positions in epistemology. Observation, perception, imagination, and so on, are all intensional relations, i.e. these relations all require for their semantic evaluation world shift. Thus certain sorts of ways of treating intensionality which are forced on philosophers by what they say about the nonexistent will also rule out certain sorts of ways of treating intensional relations such as observation. The traditional problems of epistemology - problems which, significantly, have been seen as of central importance in philosophy only since the rise to dominance of empiricism and associated logical extensionalism - are created by the failure to appreciate the intensional inexistential character of perception or to treat its intensionality properly. Often they are the product of attempts to extensionalise perception relations, of treating perception relations as if they were like paradigm extensional relations such as 'kicks'. The traditional "problem cases" appear when the intensionality of the relation cannot be ignored. Thus the problems of illusions and hallucinations (i.e. cases where the perceived item does not exist), and of the incompleteness and selectivity of observation (cases where the relation is referentially opaque) are cases where the intensionality of perception relations is clearly manifested.

The proof of these claims lies in the detailed demonstration in at least certain crucial cases. In what follows the critical cases of universals and of perception are treated in considerable detail, and subsequently various other cases, drawn for instance from the philosophy of mind and value theory, are considered but in lesser detail, since leading features of the treatment transfer from the critical cases.

§8. *Illustration 1: Universals. Nonexistence and the general universal problem.* The rejection of the Ontological Assumption, and the further step of allowing nonentities some determinate properties, makes it possible for the theory of items to avoid all the standard positions and difficulties on universals. For the standard positions on universals arise from the implicit acceptance of the Reference Theory, the Ontological Assumption particularly (as Reid pointed out long ago; 1895, p.375[1]): without the Assumption there is not nearly so much to explain.

The problem of universals is usually taken to concern the existence or nonexistence of abstractions, such as attributes, about which true statements can be made, or which have a place in some theory. But the same problem - the general universals problem - arises whenever true statements are made or appear to be made about any item, abstract or not, which does not exist or whose existence is doubtful or sometimes doubted, e.g. the self, substance, external objects of perception, other minds, future happenings, etc. - in short, wherever philosophical scepticism can arise. Not only do the same problems arise, but the same positions - parallelling the triad, nominalism, realism or platonism, and conceptualism or subjectivism - emerge in an attempt to meet the problem.

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[1] Reid's position is further considered in 12.1.

Which positions emerge depends primarily - for positions that rely upon reductive analysis, as do all usual positions except the most hardline - on what surrogate entities the analysis attempts to reduce problematic objects to. Thus, for instance, if the entities are words the resulting position is a nominalism, if concepts or meanings a conceptualism, if subjective ideas a subjectivism. As a first example consider analyses of natural numbers: according to nominalisms these are (really) numerals or nominalistic constructions (such as fusions) of these, according to conceptualisms concepts, according to subjectivisms (or intuitionisms) mental ideas or mental constructions. Since the question of statements about numbers turns out to be but a special case of the general issue of statements about properties and their analysis, a second example is provided by the nominalistic and other analyses of properties. A third example is the attempt to analyse intensional sentences; these demand analysis because, among other things, so many of them ascribe (intensional) properties to items which do not exist. Nominalistic analyses typically attempt to analyse intensional sentences in terms of quotation; thus several analyses already rejected, e.g. Carnap's analysis of belief sentences, Quine's analysis of certain modal sentences, and still fashionable analyses of intensionality in terms of metalinguistic translation. Why nominalists prefer quotational analyses, when they can get away with them, is simply explained: according to them the only things there are are individuals, and, as a special case of these, words. Everything then is either a word or an object (= extralinguistic entity): that's all there is (= exists). Since statements ascribing intensional properties are often not about extralinguistic entities, they must be about words. As a final example, consider analyses of temporal discourse, in particular of sentences about past and future items. Platonists, encouraged by relativity physics, boldly assert that past and future items all do exist. But according to more cautious subjectivists, of whom Augustine is a good representative, statements about past items should be analysed in terms of memory statements and statements about future items in terms of expectations; and the relevant memories and expectations of course exist now. Direct nominalistic analyses according to which a statement about Aristotle is really about the name 'Aristotle' are patently implausible; instead nominalists usually insist that 'Aristotle' is really a disguised descriptive phrase ('the man who ...') and that true statements about past and future items should be analysed using Russell's theory of descriptions (or the like), whereupon the recalcitrant names of past and future items disappear into secondary occurrences of descriptions. Whatever the example, the following methodologically unsound practice is to be observed:- Wherever such reductive analyses patently cannot be performed or are just too implausible, there is an attempt to dismiss sentences whose truth we are supposed to explain, to write off these sentences as meaningless, in some way unintelligible, etc., and anyway as not needed (e.g. Quine advocates just such a write-off of many intensional sentences, in his 'Flight from Intensionality' of 60).

The general universals problem arises from the fact that if the Ontological Assumption is accepted as a criterion of what we can legitimately say, what we can legitimately talk about appears to be much less than what we seem to be able to say and what we need for many purposes to say. If it is true that no statements about nonentities are true, then a great many important theories would be false or doubtful. The correctness of mathematics would be as doubtful as the existence of the numbers and other objects it treats. The standard positions are attempts to close the gap between the Ontological Assumption and the obvious facts. Faced with the gap between the facts of discourse and the Ontological Assumption, the standard positions are, like the blind man and the elephant, each seizing on some aspect of the facts and emphasizing it at the expense of the others. (They have been blinded by the Ontological Assumption.)

Thus the nominalist chooses to regard the existence of certain items (characteristically individuals), and the nonexistence of others (invariably abstract objects) as the hardest fact, and is not prepared to compromise on the nonexistence of such objects as abstractions, even if this means abandoning discourse in which they appear. But the nominalist is also prepared to accept the Ontological Assumption as a criterion of what can truly be said, and resigns himself to dispensing with the superfluous discourse and theories. The nominalist argument is: only items of sort α exist, but the Ontological Assumption is correct; therefore only items of sort α can really figure in true statements.[1] All the rest it is our duty to renounce.

This is a hard position, and hard to maintain. The nominalist therefore looks for a way to soften it which will not infringe his principles. He will not admit any enlargement of the class of items said to exist; the only way any of the renounced statements can be readmitted is by reducing such statements to statements about items already in the class whose existence is admitted. He will not admit abstractions, so he cannot admit a reduction to concepts or meanings. But although doubtful items do not belong to α their names do. The only systematic reduction of left-over statements that is open to the nominalist is a reduction of statements about nonentities to statements about their names. (Hence the term 'nominalism' and the characterisation of nominalism as the doctrine that abstractions and nonentities generally are mere names.) In modern terms the nominalistic reduction becomes a metalinguistic one; to be acceptable, nonreferential statements must be analysed as referential statements in the object language, or, failing this, as referential statements in the metalanguage. At each level we stay within the framework of the Reference Theory.

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[1] Nominalist sects differ as to the constitution of sort α. Historically important sects are materialisms, according to which only material things exist (thus Hobbes), and idealisms and subjectivisms, according to which, in pure form, the only things that (really) exist are ideas or are mental (thus Berkeley). Recently nominalism has taken some different turns; in particular, Goodman (e.g. in 77 and in PB) has attempted to redefine nominalism in terms of the recognition of individuals as the only things that exist, where an individual is anything (one likes, including even abstractions and spirits, providing they are construed as individuals) that satisfies certain logical conditions furnished by the calculus of individuals, most notably a strong extensionality requirement which abstract classes do not satisfy. But if particulars such as communities, forests and ecosystems exist the strong extensionality requirement, like other stringent requirements on individuals, appears too strong. Elsewhere Goodman characterises nominalism as 'a refusal to recognise classes,' which is too narrow and would make Armstrong 78 and perhaps Russell (of 8) nominalists; but he seems prepared to expand this to 'a refusal to recognise abstractions', which is nearer the mark. For if to recognise is to acknowledge or claim the existence of (one, just one, of the ordinary senses of the tricky verb 'recognise') and if individuals (or, apparently, particulars) are what contrast with abstractions, then we are back with nominalism as the position which acknowledges the existence only of individuals (or particulars). If, however, 'recognise' means 'acknowledge the validity or genuineness of' (part of the OED sense) we are not back at all with the Ontological Assumption. But of course Goodman, like other nominalists, takes the Ontological Assumption for granted: talk about what does not exist, about nonindividuals, is not legitimate.

Because acceptance of the Ontological Assumption is a common denominator of nominalisms and platonisms, classifications of the sects are not of much importance. For anyone who is interested in such classification, the latest in rococo structuring of the positions may be found in Armstrong 78.

If the nominalist regards what exists as settled and takes the Ontological Assumption as a criterion of what can truly be said, the platonist takes what can truly be said as settled and applies the Ontological Assumption as a criterion of existence. We do make true statements about abstractions, and perhaps about individuals such as Pegasus and the round square; since the Ontological Assumption is correct, they must therefore exist. The obvious subjects in such discourse are the correct and proper subjects, and they cannot be analysed away. The platonist gives priority to the fact of discourse about nonentities, and is prepared to manipulate the concept of existence and expand the class of existing items to maintain such discourse.

This hard-line platonism resists reanalysis of problematic statements; according to it they are really about what they seem to be about. But as in the case of nominalism, the hard position is worn away into various compromise positions.

There are two basic ways of modifying this extreme platonistic position. Because in the ordinary sense of 'exist' in which furniture and horses exist, abstractions and fictions do not, the platonist usually seeks to make this position more plausible by insisting that such doubtful items do exist, but in a different sense. Thus numbers have 'mathematical existence,' fictions 'fictional existence,' etc.: generally, the objects of any theory ϕ that truly attribute properties to the object whose existence is in the ordinary sense at best doubtful, have ϕ-existence. This doctrine of levels of existence has already been attacked, in chapter 4 and elsewhere. What is relevant at this point, is that, by so expanding the senses of the word 'exist', that no item fails to exist 'in some sense', the Ontological Assumption is made to exclude no discourse. This is therefore a dishonest attempt to evade some of the ill-effects of the Ontological Assumption while maintaining the appearance of conforming to it, and taking advantage of some of the information existence supplies. This platonist no longer treats the Ontological Assumption in full seriousness, but lacks the courage to declare it false.

The second way of softening the hard platonistic position is to attempt to reduce the number of items claimed to exist by reducing statements about some sorts of items to statements about other sorts of items. In this way the number of doubtful items claimed to exist might, it has seemed, be reduced to just a few sorts, e.g. concepts or attributes, or for those not prepared to accept intensional notions, classes. At this point the position differs from the nominalistic position only, but fundamentally, in admitting certain classes of abstract items that are said to exist. This platonism typically requires at most two senses of 'exist,' individual existence and abstract existence, but it incurs all the difficulties associated with a reduction. The form of this qualified platonism which aims at a reduction to concepts is sometimes called conceptualism. In fact platonism fragments under softening into various positions according to which sorts of abstract objects are taken to exist. All these compromise positions are however like the extreme positions in accepting the Ontological Assumption, and, what is characteristic of platonism, the assumption that some abstract objects exist, of course remains.

A further variant on platonism, commonly not included in the typology of positions but widespread, attempts to have the best of each of these positions by combining the Ontological Assumption, as a criterion of existence, with a pragmatic theory of truth. The fruitfulness or convenience of discourse or the goodness of a theory, becomes the test of existence. This position, opportunism, includes Occamism. According to Occam's Razor, entities should not be multiplied beyond necessity i.e. one should be prepared to tailor one's claims about what exists to one's needs. Occam's Razor counsels a restrained opportunism. Opportunism, like the other positions, accepts the Ontological Assumption.[1] But it exhibits a conflicting attitude towards existence; for by accepting the Ontological Assumption it concedes that existence is a serious matter for what can be said; but by treating existence claims as capable of being settled on pragmatic grounds, e.g. of expediency or what is good for business, it reveals that it does not really take existence seriously at all. This conflict typifies positions which attempt to keep the Ontological Assumption and mitigate its effects.

Philosophical analysis is the main method of attempting to mitigate the damaging effects. The nominalist often hopes, by reduction or analysis of problematic statements (apparently) about universals to unproblematic statements (about, e.g. particulars), to increase the scope of what he can truly say; while the platonist hopes, by similar analyses, to limit the scope of what he has to say somehow exists. In each case replacement is the objective: the aim is to provide another set of entities which the problematic statements are said to be "really" about. In the same vein the sentences for which an analysis is demanded are said to be misleading as to logical form (because they do not match up with the philosophical theory combined with the Ontological Assumption). The analysis is supposed to show, when the resulting logical subjects of the analysing sentences are considered, that the sentences really are about entities after all.

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[1] Given the Assumption the classification of positions projected exhausts the possibilities. For given that items must exist for true ascriptions of features to be made to them, we must say, of apparently true ascriptions of features to nonentities, that either the items do exist somehow (the problematic is unproblematic after all), or that the sentences are really about different admissible entities (the problematic reduces to the unproblematic), or that the statements are not true at all (the problematic is beyond redemption). The genuine opportunist will try to play all these lines as suits his case, a strategy which naturally makes his position rather more difficult to refute. The same classification of positions applies also to the general universals problem. It is precisely the triadic classification of positions into transcendental, reductive, and sceptical that Wisdom has considered in detail in the case of many characteristically philosophical problems (see Wisdom 52 and 53; also SMM p.191).

Much of modern philosophy is based on the hunt for the entities various troublesome sentences are (supposed to be) really about and for the associated logical analyses. Once again it is argued that we must supply existent (transparent) items to which reference is made, to explain the truth of the statements in question.

Once we have got rid of the Ontological Assumption, however, of the idea that what we can talk about correctly coincides with what exist, there is once again no need to try to locate such entities and such analyses. It is not unfair to comment that promising analyses are not so often found, and that, almost invariably, those that are found succeed only for limited classes of cases (e.g. provided various classes of statements are excluded, and provided replacement in highly intensional contexts is not demanded.)

It is all too commonly assumed that analysis is the only way of removing existence assumptions. Realists are especially prone to this error, and not surprisingly, for the assumption, like the whole apparatus of platonism, rests on the Ontological Assumption. For given that true statements are made about xs,[1] e.g. of the form 'a has property x', but that xs do not exist the statements must be analysable into equivalent true statements not about xs. The assumption that analysis is compulsory underlies the whole classification and assessment of positions on universals in Armstrong 78 (the assumption surfaces explicitly in 78 vol. I, pp. 17-18; but in implicit form, such as on p.61 of vol. I, the assumption is pervasive throughout the two volumes). As it happens, there is a perfectly satisfactory analysis (up to coentailment strength) of the form Armstrong takes as problematic, namely 'a has the property, F', but Armstrong does not consider the analysis among his varieties of nominalist strategies (I, p.12 ff.; II, p.1 ff.). Armstrong considers properties expressed in the form 'being ϕ' (rather than, e.g. $\lambda x\ xf$); then, by a direct analogue of a λ-conversion thesis,

a has the property, being ϕ, iff a is ϕ,

e.g. a has the property, being white, iff a is white. The analysis avoids all Armstrong's objections to nominalistic analyses of the given form. Of course the analysis does not shield nominalism from Armstrong's positive arguments for platonism (especially I, p.58 ff.); for 'being ϕ' may occupy a subject position, admit of quantification, etc., whereas the analysis only eliminates 'being ϕ' from a certain class of sentence contexts. But the fact that property subjects, such as 'being ϕ', cannot be eliminated by analysis from subject positions in true statements does not show, what Armstrong assumes (p.61), that the properties designated exist. That is just the Ontological Assumption over again. Indeed the Pap-Jackson argument, from the uneliminable occurrence of property terms in subject positions, which Armstrong applies 'to show that the truth of a certain statements demands the existence of universals' (II, p.2), depends essentially on the Ontological Assumption.[2]

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[1] In the universals case it is not just that statements are made but, as Armstrong emphasizes in 78, the apparatus of universals, especially as illustrated by type-words, is continually used even by nominalists. A similar point was made long ago by Reid, both as regards universals, and as to other problematic items heaved up by the general universals problem - to which Hamilton felicitously replied (in the case of the necessity of causes: Reid 1895, p.457):

> It is the triumph of scepticism to show that
> speculation and practice are irreconciliable.

(footnote [2] on next page)

Another recent example of the analysis assumption at work occurs in Chisholm's case for an 'ontology of states of affairs'. Chisholm contends that

> If (i) there is a sentence which seems to commit us to the existence of a certain object, (ii) we know the sentence to be true, and (iii) we can find no way of explicating or paraphrasing the sentence that will make it clear to us that the truth of the sentence is compatible with the nonexistence of such an object, then it is more reasonable to suppose that there is such an object than it is not to suppose that there is such an object (76, p.117).

Chisholm argues that there are sentences concerning states-of-affairs that satisfy conditions (i) and (ii) and for which there appear to be no paraphrases which avoid commitment 'to the existence of propositions or of states of affairs'. Chisholm's working conclusion, despite the hedging in (iii), is that states-of-affairs exist, not merely that it is more reasonable to suppose that they exist than not; that is, the operational conclusion is that without analysis or paraphrase, existence follows. But, as Chisholm rightly says (p.117), it doesn't. Nor does the hedged claim. Moreover Chisholm's argument that sentences concerning abstract states-of-affairs satisfy conditions (i) and (ii) depends essentially on the Ontological Assumption. The argument is, in outline, that true statements of intensional attitudes may have a common object, a state-of-affairs; only the Ontological Assumption lifts the object to existence.

The distortions of all the usual positions on universals are forced upon them by their unquestioning acceptance of the Ontological Assumption. It is only the Ontological Assumption that forces us to choose in this way between taking a sensible position on what exists (as the nominalist may), or else (like the platonist) taking a sensible position on what we can talk about, and what can appear in a theory, but not both. Once the Ontological Assumption is abandoned, we can recognise that something does not exist without denying ourselves the privilege of making true statements about it. Hence the traditional problem of universals fails to arise for the theory of items. The position of the theory of items on universals differs from all the traditional positions but has points of resemblance with both platonism and with nominalism. Like platonism, the theory of items recognises the importance of statements about apparent nonentities, and recognises that they cannot simply be dismissed or ignored. But like nominalism the theory of items is unprepared to explain these facts by the platonistic technique of expanding the class of what is said to exist beyond what does exist. Like nominalism the theory of items is able to retain the ordinary sense of the word 'exists'; but unlike the nominalist the noneist is not obliged to renounce statements about abstractions and other nonentities. He is able to keep the ordinary sense of 'exists' without these consequences only because existence is no longer a necessary condition for the possession of properties.

(footnote [2] from previous page)

Armstrong in fact thinks that an analysis of such statements as 'Redness is a colour' and 'Red resembles orange more than it resembles blue' (the sort of statements Pap's argument relied upon) can be provided: his argument is that certain prominent sorts of nominalists cannot give any analysis of them.

The platonists and opportunists, because of their readiness to manipulate what is said to exist, have tried to give the impression that there is no stable sense of the word 'exists.' The use of the Ontological Assumption as a criterion of existence encourages this belief in the instability of 'exists,' because different conceptions of what can legitimately be spoken about result in different conceptions of existence. But 'exists' does have a stable sense, and what exists cannot be decided by preference, convenience, bargaining or alleged necessity of some sort. It has nothing whatever to do with what we are prepared to talk about. No expansion, however arbitrary, of the word 'exists' makes it plausible to say that items with inconsistent properties exist, and yet they can be said to have properties, and we are prepared to make true statements about them. Nor is it plausible to claim that an item exists when some property which is decidable in principle by investigation of the item, is indeterminate of it. If an item exists its descriptions have a reference, and this reference determines completely its referential properties. Since the (actual) reference settles these matters, that there is no way, even in principle, of settling such matters is a good sign that there is no reference. If something is said to exist, it is reasonable to expect to be able to investigate it, to differentiate it from other items of the same kind, and to be able to stand in certain relations to it, relations one could not expect to have to a nonentity. If a swimming pool is claimed to exist, we can expect (in principle at least) to be able to swim in it, but we should not expect to swim in a nonexistent swimming pool. If a horse is said to exist, we can expect it to have certain specific and detailable properties such as colour, weight, age, sex, location, etc., but we can hardly have all these expectations about nonexistent horses, about the Horse or the average horse. The normal distinction between what exists and what does not is supported by certain expectations and activities; the rules that govern the use of the word 'exists' in normal discourse are not Rafferty's rules. Nor is it the case that the concept of existence even in classical logic is quite as malleable as the Platonist supposes it to be. In classical logic existence is part of a whole network of interlocking concepts, and is tied down by more than just the Ontological Assumption. If an item is introduced as existing it becomes subject to all the rules for referential occurrence, not just those following from the Ontological Assumption. But if the item does not exist many of these rules break down. Because of this, the strategy of retaining the Ontological Assumption by stretching the word 'exist' so as to capture a larger class of items than do exist, necessitates important and eventually drastic changes at other points in the logical theory, e.g. the theory of intensionality.

Existence, then, both in normal discourse and in classical logic is tied down by its links with other notions such as consistency, completeness, reference, and assumptibility. But, as the platonist hastens to point out, there is nothing to prevent us using the word 'exist' in any way we please. However, it is not unreasonable to require that before we adopt a usage which is misleading and liable to cause dislocation and equivocation, it should be clear that the gains from doing so at least outweigh the losses. If the Ontological Assumption is to be dropped, we gain nothing by the platonistic reformation of 'exists', for we can attribute properties to such items even when they do not exist; on the other hand, we do lose a valuable distinction, and as a consequence we are forced to treat the items we have introduced as existing in a completely inappropriate fashion, i.e. by subjecting them to the rules for referential occurrence, and treating them as if they are complete. But if the purpose of the platonistic reformation of usage is, as it seems, to save the Ontological Assumption, this amounts to rubbing out a perfectly good distinction in order to save a faulty theory.[1]

These points make it clear once again that the platonistic and opportunistic attempts to solve the universals problem by tampering with the word 'exist' represent a different resolution (and a less effective one) than that proposed by the theory of items, namely the explicit rejection of the Ontological Assumption. Nonetheless, as already observed (e.g. in 4.3), there has been an attempt to confuse the position of the theory of items with platonism by using the Ontological Assumption as a criterion of commitment to existence, and even worse, by assuming it in the very characterisation of the options open on the universals problem.

The position of the theory of items is platonistic, according to this view, because preparedness to talk about and attribute properties to an item commits one to its existence. It is often claimed that ordinary language is platonistic on the same grounds - when the truth is that it, like the theory of items, fails to conform to the Ontological Assumption. The criterion of existential commitment assumed is however is as unsatisfactory as the Ontological Assumption on which it is based. There are many attributions of properties to items which do not presuppose their existence. It is perfectly consistent to say 'I am thinking about something which does not exist'. Of course, it has nowhere been denied that there are certain contexts, certain ways of talking about an item, and certain properties, which do presuppose existence, but it is enough that there are others which do not. Neither in the sense of 'exists' embodied in ordinary language, nor in the refined sense of the theory of items, does the mere attribution of properties to nonentities commit one to their existence.

The craftier move of using the Ontological Assumption in characterising positions on universals redefines a platonist as a person who is prepared to talk about ('countenance','recognise', 'accept') items which do not exist. This not only assumes the Ontological Assumption, but involves the further fallacy of assuming that everyone accepts it. Even if the Ontological Assumption were true, it would not follow that the position (philosophical opinion) that nonentities have properties is the same as the position that nonentities exist. For even if A is logically equivalent to B, that someone believes that A, or asserts or claims that A, does not imply that he believes, asserts or claims, that B. One might as well say that if God does not exist a theist is a person who believes that a nonexistent item exists. A similar invalid principle is involved in the characterisation of the platonistic position as one of being prepared to talk about nonentities. When platonism is properly characterised, the theory of items is not at all easily - and certainly not correctly - convicted of platonism.

The rejection of the standard positions on universals goes only so far: it leaves much to be done. So far the argument has taken it largely forgranted that universals do not exist. This indeed appears to be the commonsense position and the uncorrupted naive position,[1] but it requires some argument. The core of the argument always concerns however criteria for existence - a matter taken up in the next chapter (9.9) where the question of the existence of universals is reassessed, and where some argument added to commonsense convictions. Nor so far has a classification of universals been considered, nor questions of the properties and relations of universals, especially their relations to particulars.

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[1] All that may be saved in the end is, as we have revealed, the appearance of the retaining the Ontological Assumption, since the original Ontological Assumption is changed as the sense of 'exist' is changed.

§9. *Illustration 1 continued: Neutral universal theory, and neutral resolution of the problems of transcendental and immanent theories.* Universals of a variety of sorts - e.g. properties, relational properties, relations (of many adicities), classes; functions and operations - form an indispensible, and uneliminable, part of what richer discourse is about. Their indispensibility for theoretical purposes, especially for classification and explanation, is acknowledged, perhaps most vociferously, by those engaged in disposing of them and who would analyse them away if they could (e.g. Bentham, Vaihinger, Quine). Their general uneliminability is shown by the unsolvability of various elimination problems, e.g. in the case of relations, by Ackermann's results (in 35; stated in Church 56, p.305), and by indefinability theorems. Such results put an end to philosophers' claims that talk of universals, of one sort or another, can be paraphrased in favour of quantificational talk about particulars (at least if requisite properties such as truth values are to be preserved by the paraphrase), claims that are typically based on but a few examples (as an example, consider Ryle's discussion of universals as systematically misleading expressions in 71).[2]

The theory of objects accordingly includes - in order to accommodate richer discourse it has no option but to include - universals among its objects. But the universals of the theory are neither transcendent nor immanent. That classification presupposes that universals exist. Were universals to exist there would be a problem, a traditional problem as to how and where they exist, in particular a problem as to whether they exist separately from particulars (transcendent positions) or not separately from particulars but "in" particulars (immanent positions). But since they do not exist, the traditional classification is falsely premissed, and offers only a false choice. A further position can be taken, a neutral position. With the removal of the false premiss, the main difficulties of transcendental and immanent universal theories are removed.

Consider the supposedly serious problem for transcendental theories, namely what relation holds between particulars and universals (cf. Armstrong 78, p.66 ff.). The obvious commonsense answer can again be unproblematically given by the neutral theory, namely in the property case, particulars have, or instantiate, properties. The logic of attributes of the neutral theory is based on the neutral logic of λ-conversion (the fuller logic of universals is further discussed below).

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[1] It is also a long-standing philosophical position, which has nevertheless been lost from the modern repertoire: cf. again the Epicureans and Reid cited on pp. 1-2.

The position of the early Russell (e.g. in the Principles 37) which superficially looks like an ontological translation of the noneist position, is really a two-kinds-of-existence platonistic position. So too it seems (though it is difficult to be quite sure) is the neglected position of Moore (set out in the later chapters of 53). Meinong's position is more vexed: though it permits of a noneist reconstruction, it also lends itself to kinds-of-existence construals (see further 12.2).

[2] Strictly a philosopher who claims that a class of expressions is eliminable in one way or another owes us, eventually at least, a proof of the matter.

Consider the separation of particulars and universals that engenders difficulties for transcendent theories (cf. Armstrong 78, p.68; Armstrong indeed takes the argument that follows to refute transcendental realism, vol. II. p.2). Consider a particular a without the property of whiteness; it is still possible, if a exists separately from the property (at least in the sense of separately which implies independently), that a is white. On the neutral theory the difficulty vanishes: a is white iff, as a matter of logic, a instantiates whiteness. There is no separate, or independent, existence of particular and property, for properties do not exist.

The objection from causal efficacy may be similarly met. Consider the vaunted problem: if a thing's properties are determined by relations to universals then the thing's properties cannot be causally efficacious (cf. Armstrong 78, p.75). But a thing's standing in an instantiation relation to a universal λf is logically tantamount to a thing's f-ing. So there is no more problem for the relational account than there is for an immanent one.

Consider the vicious infinite regress of relativism that is alleged to rebut any relational theory relating particulars to universals (cf. again Armstrong 78, p.70, p.77). On such a theory af is logically equated with and analysed as (in one sense) a's having R to a ϕ; specifically R is the relation of instantiation, ι, and ϕ is the property of f-ness, λf. Then $aR\phi$

> is one of the situations the theory undertakes to analyse. So it must be a matter of the ordered pair $\langle a, \phi\rangle$ having R' to a new ϕ-like entity: ϕ_R. If R and R' are different, the same problem arises with R' and so ad infinitum. If R and R' are identical the projected analysis of $Ra\phi$ has appealed to R itself, which is circular (Armstrong 78, pp.70-1).[1]

Consider what the theory of λ-conversion yields:

$aR\phi$ iff $\langle a, \phi\rangle\ \iota\ \lambda a\phi(aR\phi)$, i.e. (for short) iff $\langle a, \phi\rangle\ R'\phi_R$,

where $R' = R = \iota$ and $\phi_R = \lambda R = \lambda a\phi(aR\phi)$. Thus $R' = R$ and no vicious regress ensures. What of the circularity? It is immaterial: the (neutral) relational theory did not pretend to be, and is not, fully eliminative. The failure to be fully eliminative does not render a theory unexplanatory; the neutral theory can account for much discourse which likewise cannot be paraphrased out without residue.

The Third Man argument is not effective against attribute theory, since often enough self-predication fails, i.e. the property of f-ness is not f, heaviness is not (significantly) heavy. Is it effective in cases where self-predication appears to hold, in some special cases where a property has itself as property, as for example in the case where the property is the property of being a property? Armstrong considers such an argument which he calls 'the Restricted Third Man.' Restated in terms of properties (Armstrong calls transcendent properties 'forms') a variant of the argument, expanded to distinguish predicates Armstrong improperly conflates, runs as follows: Consider the predicates p, 'is a property' and, p_1, 'is a first order property.' For every property, λf, $(\lambda f)p$, and in particular $(\lambda p)p$, i.e. the property of being a property is itself a property; and while for every first-order property λf, $(\lambda f)p_1$, $\sim(\lambda p)p_1$ and $\sim(\lambda p_1)p_1$, for the property of all properties of an order is not of that order (at least on usual order theory). Now consider (with Armstrong (p.73)) the collection of all first-order properties plus λp. They have something in common all right, but not what Armstrong suggests, a third order property of propertyhood, but simply λp itself; that is, there is no regress. If on the other hand the class of first-order properties together with the second-order property λp, is considered, then all these properties do fall under a third-order property. There is again no vicious regress, though order theory is certainly uneconomical, as Armstrong complains (but really this is one of the least of the defects of order theory). Nor is order theory necessary; for there are several alternative theories. But dropping order theory in a way which at the same time removes any regress or hierarchy appears to encounter another of Armstrong's objections, namely that a property cannot have itself as one of its properties.[1] Is this so: surely $\lambda p \iota \lambda p$? Armstrong's argument is to the contrary is not impressive. It is that $\lambda p \iota \lambda p$, being of the form aRa, would be a reflexive relation: but no relations are reflexive! (vol. II, p.143 and pp.91-3)

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[1] It is worth remarking that this sort of objection, were it to carry any weight, would equally undermine standard semantical analyses of predicate logics.

The case made out[2] for this astonishing, but by no means unprecedented claim, consists, firstly, of the following points against familiar examples of supposedly reflexive relations:-

1. With such connections as identity, resemblance, sameness, etc., the "relation" could be determined a priori; but, by empiricist principles, no relations can be shown to exist by a priori methods (pp. 7-8). But the claim is that the relation, e.g. identity, is reflexive, not that it exists - to derive which would require, what the argument presupposes, the Ontological Assumption. And while existence may not be determinable a priori, many features of objects are, as for instance in mathematics and logic.

2. Such relations would have no causal powers to act upon particulars which have them. Were the relations to exist (in the ordinary, as distinct from stretched platonic senses) the objection would be telling, but as explained under 1, they do not.

3. Natural examples of reflexivity, such as loving, amusing, preening, contradicting, can be explained away, e.g. if a man loves himself then it is, it is claimed, 'other aspects of himself' that he loves. However, this is unsatisfactory. Such contortions as non-reflexive analyses of reflexive relations provide, are but distortion, and are unnecessary.

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[1] Whether this happens depends on the sort of property abstraction principles the theory has. If, for example, the theory is a neutral property-analogue of Zermelo-Fraenkel set theory then any "regress" will give out when property abstraction gives out, but no property need have itself as one of its properties.

[2] The underlying reason is however to be found in the relations that Armstrong's scientific realism can sanction as existing.

Dissolving the Third Man argument in the case of properties does not penetrate to the heart of the matter. For the argument is stated in the initial part at least of its original formulation (in Plato's Parmenides, 132B), in terms not of properties, but ideals (or paradigms). With ideals self-predication is the rule, the ideal x is always an x, e.g. the (ideal) Horse is a horse. The ideal Horse, unlike the corresponding property, equinity, can be put alongside particular horses as a horse. Surely then the Third Man argument is damaging to any theory of ideals? It is damaging if (i) an ideal is posited to explain (on its own) the common feature or sameness of all the objects of which it is accounted the ideal, and (ii) an ideal is always distinct from elements of classes with respect to which it is the explanation of sameness. For consider the class consisting of all the objects with a common feature plus its ideal: what explains their common nature or sameness? By (ii), the class is a new class with one more element than that the ideal accounts for, the new element being the ideal. In virtue of self-predication the ideal has the common feature, shares the sameness. By (i) some ideal explains the commonality of the new class; by (ii) it is distinct from the elements of the new class. The steps may be repeated leading to an infinite regress of ever new ideals; and no explanation is achieved of the common feature ideals are supposed to explain.

The argument leading to the regress is valid, but the assumptions on which it is premissed, assumptions (i) and (ii), are faulty. Assumption (ii) is mistaken; and (i) relies on a conflation of ideals and attributes, a confusion that runs through Plato's discussion of the theory of forms, at a very heavy cost to the adequacy of the theory. Suppose, first, (ii) is dropped. Then the obvious answer to the question that generates the regress is: the ideal itself. No regress ensues. The obvious answer can be made good. Consider a plant species of very limited distribution whose species description is based in a single paradigm specimen.[1] Other members of the species are accounted members of the species because of their similarity (resemblance, etc.) in given botanical characters to the paradigm. It is plain that the paradigm of the class plus the paradigm can simply be the paradigm itself, i.e. the putative regress stops after one step with the answer: the ideal itself. For the ideal is certainly similar in requisite respects to itself. It is not true that the explanatory feature of ideals is lost in this way. The ideal still accounts for all the particulars of its type in virtue of their relation to it. The one reason the ideal is thought not to account for the particulars of its type is that the property picture is given priority or confused with it. The property model of course derives immediately from the fact of objects which are the same, namely in a given respect, or which have a common feature. For the respect, or feature, just is the property. It is the property model, furthermore, not the ideal picture, which renders assumptions (i) and (ii) plausible. Principle (ip), i.e. (i) restated for properties, is analytically true, the common feature just is the property, which automatically (if rather trivially) accounts for the sameness in respect and hence similarity of objects which have it.[1] Further principle (iip) holds for all ordinary, specifically all predicative, properties. For classes picked out by predicative properties the One over Many argument holds, that is, for the *many* elements of the class there is *one* object, viz. the property, over and above the elements, which accounts for the common feature of the elements. But though (ip) and (ii) hold for predicative properties, self-predication - an essential ingredient in the Third Man argument - obviously does not. A predicative property by definition does not apply to itself, so self-predication is logically excluded.

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[1] The original sample does not remain the (or a) paradigm indefinitely. The specimen fades, collects dust, is damaged, etc., while the ideal, with which it temporally coincides (so to say, a way of describing the situation that can be made good), does not.

The ideal usually does but a poor job in explaining the common feature of objects of a class sharing the feature: rather it is itself partly characterised in terms of the essential features of the objects of the class.

Thus the Third Man argument is bound to fail. For insofar as the assumptions are satisfied - as they are for predicative properties which validate the One *over* Many argument - self-predication fails; and insofar as the self-predication is universally satisfied - as it is for ideals - the assumptions fail, and only a One *for* Many argument can be sustained in some favourable cases. Both the assumptions, the One over Many argument, and self-predication can be retained, but for *different* sorts of objects. The Third Man argument would succeed only by serious equivocation, by illicitly combining features of two different models, predicative properties and ideals. To complete the story two more points should be argued: firstly, that properties and ideals are indeed different; and, secondly, that they are however conflated in Plato.

As to the first, compare objects of the following lists:-

Properties	Ideals
triangularity	the Triangle
equinity	the Horse
wheelhood	the Wheel
greatness	the Great
.	.
.	.
.	.

The corresponding objects signified in each list are different because they have different extensional properties, e.g. the Triangle is three-sided, has three angles, etc., but triangularity does not. The Euclidean Triangle has all the properties Euclid proved of it; these are not properties of Euclidean Triangularity. The Horse is an animal, equinity is not; the Wheel has a long history, wheelhood being a timeless property has strictly no history; some men not seeking greatness have it thrust upon them, but not[2] the Great thrust upon them; and so on.

Along with different properties go different logics, and, in particular, different relations to particulars. Objects instantiate or have properties; they do not (significantly) instantiate or have ideals. On the other hand objects may exemplify an ideal or approximate to it; particulars do not approximate to properties; and ideals represent particulars perhaps as the most perfect examples of the type, but properties do not. The fact that the relations to particulars are different helps explain the puzzles in Plato's dialogues, persisting in commentary after commentary on the dialogues, as to what the relation of objects to forms is.

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[1] Likewise properties furnish the object X of Socratic 'What is X?' questions, not (with isolated exceptions) ideals.

[2] Most of the negations are wide negations, which include nonsignificance.

The transition from ideals to properties and back is evident in the translation of important Platonic arguments concerning the forms. For example, in the presentation of the One over Many argument in the Phaedo (100B-E) the subject shifts, without notice, from the Beautiful and the Great to Beauty and Greatness; while in the presentation of the Third Man argument (Parmenides, 131B-132B) the subject switches from Greatness to the Great, then back to Greatness (see e.g. Flew's translation in Flew 71, pp.49-50 and 70-71). Furthermore the English translations accurately reflect the original Greek, which likewise oscillates between property and ideal terminology (so Kim Lycos confirmed).

The Ontological Assumption makes an adequate account of ideals which clearly distinguishes them from properties impossible to obtain. For the Horse, unlike the property equinity, is an animal, a material item, and if it exists must exist as a material item and be numbered among existing horses. But obviously the Horse is not so numbered, and cannot so exist. Thus such ideals cannot be treated as material entities, but, unlike properties, cannot be treated either as having "abstract (non-material) existence". But this is the choice the Ontological Assumption forces. Since the Horse is not among existing horses, it is, given the Ontological Assumption, not a horse at all; no coherent account of ideals as distinct from properties is possible, and the coherent residue appears just to boil down to properties. The distinction can only be made good within a noneist theory, where such ideals can be treated as material nonentities, as distinct from both material entities and non-material entities (e.g. properties).

Problems for immanent theories of universals are likewise removed by the neutral theory. Consider for instance, the problem (discussed in Armstrong 78, p.76) that instances of a universal may diverge so far in features that they seem to have nothing in common (a point that underlies family resemblance accounts). Since there is no need to say that properties exist in entities that instantiate them, since they do not exist at all, the obvious can simply be admitted, that particulars may be unrepresentative or imperfect bearers of the property, as human freaks and serious accident cases are of the property of being human.

Very imperfect particulars help to remove any remaining temptation to define a sense of 'exists in' - a temptation to which Reid briefly succumbs (1895, p.407), despite his rejection of the main reason for attempting to characterise exists in, namely the assumption that universals exist. Russell has provided a further good reason for avoiding the 'exists in' terminology; namely, it sits far less satisfactorily with two or more place relations (see further the discussion in 9.9). Consider a relation such as north of: Edinburgh is north of London, but the relation does not exist in Edinburgh or in London or anywhere in between. It could be said that it exists in the ordered pair <Edinburgh, London>, thus suggesting also that the ordered pair exists; but it is plain at this stage that the 'exists in' terminology is otiose; whatever is expressed by R^2 exists in a and b is better said by aE & bE & $\langle a,b\rangle \iota R^2$, without misleadingly implying that R^2 somehow exists.[1] "But to reject the 'exist in' terminology is to reject a vital part of immanent theories, just as to reject 'exist separately' terminology is to reject the transcendental theories. The difficulties are being removed", the objection may continue, "by amputating parts of the theories". That is true but not quite to the point; for the objective is to show how noneism can avoid the difficulties of other theories.

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[1] The sense of 'exists in' defined does not on its own exclude separate existence, and thus a rapprochement, of a sort, of immanent and transcendental views. This can be avoided either in a weaker way, by explicitly rejecting separate existence, or in a stronger way, by defining a connection which excludes it, e.g. a connection of physical overlap between particulars and universals. Such an interrelation, if it ever held, would imply that some universals exist; so, according to noneism, it never holds.

A major problem for immanent theories concerns the relation, if any, between particulars and the universal they fall under (and that exists in them). It is a problem on which immanent theories regularly founder. It is instructive to consider how the latest model immanent theory, that of Armstrong 78, fares in this regard, and how noneism again avoids the problem. By comparison with the copious detailed criticisms of alternative views (which is however crucial to the main exhaustion argument of 78), the central part of Armstrong's immanent nonrelational theory of universals is exceedingly sketchy, and the direct arguments for it very sparse. (It occupies only a few pages, strictly only pp.108-11.) On the face of it, the theory is just inconsistent: particulars are connected with universals by a nonrelational relation. Presentations of immanent realism which admit a tie between particulars and universals (e.g. Johnson 21, Bergmann 64 and Strawson 59; especially Strawson's 'nonrelational tie') certainly suggest this; for what is a tie but a relation of a certain sort? But of course the appearance of inconsistency is easily avoided by narrowing the sense of 'relation' so that some connections - relations in an ordinary sense - are not relations. The tie (connection)/relation distinction parallels a kinds-of-relation distinction[1] that also serves to explain, only *much* more satisfactorily, the connection of particulars and universals; namely (to revert once again to λ-conversion), particulars *have, or instantiate*, attributes, but the relation of *having*, or *instantiation*, is not a physical or Brentano one. Armstrong, however, rejects talk of 'ties', in favour of talk of 'a real distinction' between particulars (this-suches) and properties (repeatables). The rejection leads him to say that symbolism of first- and second-order predicate logic which suggests that particulars are related to properties (e.g. 'Fa', '(∃x)Fx', '(∃P)P') is 'potentially misleading'. In the same vein he would have to reject as misleading the ordinary semantical analyses of these logics, and also the symbolism of such fundamental schemes as af iff $a \iota \lambda f$.

The nonrelational thesis is that the properties of a particular are not related to that particular (p.108). The arguments for the thesis are these: most important (see especially p.102), the failure of all alternatives (an argument noneism disposes of by production of an alternative not examined in Armstrong at all), appeal to a "great tradition" (a variant of the argument from authority), and the availability of models of concurrence without relation. One case of the latter is this:

> we are certainly able to distinguish between their [i.e. empty spaces or vacua] unrepeatable particularity and their repeatable properties (dimensions, etc.). Yet these aspects are inseparable and far too intimately conjoined to speak of their being related (p.110).

Granted the distinction can be made, that does not exclude a relation between the items distinguished, and surely intimate conjunction - or, for that matter, inseparability - is a relation (in fact Armstrong subsequently takes conjunction as a relation; see, e.g. II, p.38). Armstrong's main model is

> the way that the size of a thing stands to shape. Size and shape are inseparable in particulars, yet they are not related. At the same time they are distinguishable, and particular size and shape vary independently (p.110).

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[1] This more satisfactory way is not open to nonrelational immanent realists, by definition of their position; nor is it open to certain relational theorists.

The "model" does not reflect crucial features of what it is supposed to model, e.g. neither size nor shape is a particular or this-such, size does not (significantly) have shape, etc. Nor is it true that size and shape are unrelated, e.g. a circular house gives maximum floor space. It is false that size and shape vary independently: there are constraining relations. Nor would an improved model exclude obvious relations between particulars and universals, such as instantiation. It is essential to Armstrong's case, and to nonrelational theories generally, that relations such as instantiation be excluded in one way or another.

The extensive argument Armstrong presents that any relational form of immanent realism is inadequate is however quite inconclusive. For what is criticised is (apart from an isolated paragraph on p.104) but a special case of the position, 'the view that a particular is composed of a substratum related in a certain fashion [support] to properties' (p.106). Examining the isolated paragraph in detail would take us back over ground already traversed. Armstrong's claim is that it is not possible to characterise the relation supposedly holding between particular and property. But the relation of instantiation can be characterised with considerable logical precision in a way which, though it is sui generis, is not metaphorical or analogical. Despite his no-relation thesis, Armstrong subsequently speaks of particulars enfolding universals within themselves (p.116). The analogical sense can be explicated: a enfolds F within a iff a instantiates F. Relations are not so easy to avoid.

Criticising or correcting rival theories is mostly an easier task than enlarging upon the theory to which one is committed (as the Armstrong example indicates, and as exponents of noneism soon find out). Yet to leave neutral universal theory without some expansion of the positive theory will hardly do, especially when it is here that the main difficulties of, and open problems for, the theory lie. To begin with, it is difficult to characterise universals or abstractions decently, though doing so is an important matter if the claim that some particulars do not exist is to stand and the thesis that all nonentities are abstractions to be refuted. It can hardly be pretended that the elements of the contrasting pairs universal/particular and abstract/concrete are distinguished by their clarity. Moreover many of the accounts that have been proffered write in philosophical theories in an objectionable or prejudicing way. For example, the account of a universal as a 'general notion or idea' (as in OED) would make all universals concepts (OED definition again), thus assimilating them to attributes of a certain kind and ruling out such important universals as ideals; for it is not true that the Horse is a notion or the Whale an idea. But the real danger of accounts like the OED's is that they tend to suggest - what was regularly assumed until the work of Meinong, Frege, Moore and Russell - that abstractions, universals and notions are all in some fashion mentalist and to be accounted for psychologistically. Such an assumption was itself a product of the Reference Theory, as it was taken for granted that whatever was spoken truly about that mattered must exist, somewhere, and so commonly assumed that universals, since not in space-time, must exist in the mind. With particular and concrete the situation is worse: it is commonly assumed that a particular or concretum is a thing that exists (cf. Strawson 59), in the case of concretum, exists in a material form (cf. OED). But many nonexistent objects are particulars, e.g. Holmes, Pickwick, Gandalf, and so on: they are certainly not universals. (Though even this has been disputed, e.g. Kripke's astonishing claim in 73 that fictional objects are abstract entities.) Fortunately there are better accounts from which to start, e.g. that of a universal as a 'thing that by its nature may be predicated of many' (OED) - though strictly this applies only to such universals as attributes and classes - and of an abstraction as something 'stripped of its concrete accompaniments' (OED again), but neither of these will serve as characterisations.

Rather than venture general characterisations it is perhaps wise, and adequate for present purposes, to rest satisfied with some conditions on what count as universals and as particulars and what do not, and with rough classifications of each category. Though it is true that universals are, in a good sense, general and particulars are not, this feature is of only limited help, since the problem just shifts to the issue as to what is it to be general. It does however point to one of the cluster of features that serve to separate universals and particulars, the extent to which particulars are local and universals are not. To put it a little more precisely:-

C1) A particular has an approximate location in, occupies a neighbourhood in, space or in time (and usually, where the object is not a mental one, both), whereas universals do not (significantly) have such a location or place in space or time. The location of a particular need not of course be in real, or actual, space and time. Fictional characters have locations, but in fictional space-time, i.e. the space-times of worlds distinct from T.

Other characteristic differences between universals and particulars derive from this location criterion. For example, universals are necessarily immutable, changeless (to change they would have to occur in time) and so, in a sense, eternal whereas particulars can change and many do over time; universals are uncreated, but particulars commonly enough are; etc.

The location criterion yields some of the familiar features separating universals from particulars, but only some: it reveals little of the abstract character of universals (the abstractness feature) and nothing of the relations of universals to particulars, how one universal relates as exemplar or nature or species or whatever to many particulars (the one-many feature). Universals are characteristically the product of abstraction from classes of objects which may be, or include, particulars;[1] particulars need not be so characterised. There is much in the traditional literature on the processes of abstraction, but comparatively little on the logical features of the products of the abstraction, products which can be understood, furthermore, without going through the mental processes of stripping away concrete accompaniments or the like. In what sense are universals abstraction products?

C2) Abstraction criterion. Universals are abstractions, inasmuch as their principal specific features are determined through logical principles of abstraction. Moreover these principles guarantee the one-many feature. There is no single abstraction principle,[2] because there is not just a single sort of universal: much as with characterisation postulates, every sort of universal has its own sort of abstraction principles. Filling out the abstraction criterion thus involves a typology of universals. Important types include these:-

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[1] The classes may also include universals; this is part of the reason for the unsolvability of elimination problems. Some traditional and some modern accounts of abstraction fail through failure to allow for this important self-involvement of universals.

[2] While it is possible on the basis of present knowledge to formulate a general schema for abstraction principles, such a schema would be of little help, and would furthermore be liable to be overthrown as further types of universals are investigated.

Attributes including properties (one-place attributes) and relations (two or more place attributes), and perhaps, as a limiting case, propositions (zero-place attributes), But it is better to keep propositions separate. Nothing prevents attributes of more than one adicity, e.g. of λf such that both af and afb (e.g. plays, fights,...). Attributes are related to instances by abstraction principles, which give a main feature of the logical behaviour of attributes. For instance, a has the property f (e.g. being red, that of redness) iff af (on the example, is red). Generally $(a_1, \dots, a_n)$ ι $\lambda x_1 \dots x_n (x_1 \dots x_n) f$ iff $(a_1 \dots a_n) f$. The λ-conversion principle is a case of the more general abstraction principle:

$$(P\psi)(x_1 \dots x_n).(x_1, \dots, x_n) \;\iota\; \phi \text{ iff } A(x_1, \dots, x_n) \quad ,$$

which holds for extensive classes of wff of the form $A(x_1, \dots, x_n)$ which do not contain ϕ free (dialectically, for all such classes).[1]

Classes and relations-in-extension. These are the extensional analogues of attributes. They are logically characterised through abstraction and restricted extensionality principles. It follows that one class may have many members (specifically, every class with more than one member will).

Functions, both intensional and in extension. Functions may be defined, in textbook fashion, in terms of relations and identity. In the general theory a function is relative to a given identity determinate: the general condition, where $f_=$ is an n-place function under identity determinate, i.e.

$$\text{if } (\utilde{x}, y) f_= \;\&\; (\utilde{x}, z) f_= \text{ then } y = z \quad .$$

Just as attributes and classes are defined by abstraction together with, respectively, instantiation and membership, so functions tie with application. A function is an object f (a rule or operation) which applies to object $\utilde{x}$ to yield, or give, an object y. Thus f is a relation between $\utilde{x}$ and y. To be certain there is no loss of content in the relational reduction of functions the following connection (which may be made definitional in the absence of other conditions on application) is required:

$$f_= \text{ applies to } \utilde{x} \text{ to give } y \text{ iff } (\utilde{x}, y) f_= \quad .$$

But $f_=$ applies to $\utilde{x}$ to give y iff y is (=) the result of application of $f_=$ to $\utilde{x}$. Since the latter may be written, for instance: $y = f_= \utilde{x}$, the familiar connection,

$$y = f_= \utilde{x} \text{ iff } (\utilde{x}, y) f_= \quad \text{, follows.}$$

(The need for the general condition, if transitivity of the identity determinate = is not to be violated, thus becomes apparent). In ordinary mathematical practice, however, where the identity determinate is predetermined, the value of the function $f\underset{\sim}{x}$, i.e. the result of the application of the function f to an argument $\underset{\sim}{x}$ is commonly called the function, e.g. the function sin(x), x^3. Both usages may be generally accommodated by use of the λ theory, which recovers function by abstraction from its values so as to satisfy: $\lambda \underset{\sim}{x}\ f\ \underset{\sim}{x} \approx f$. The basic λ-conversion scheme for functions is then

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[1] Abstraction principles need not of course be primitive but may be derived from other principals, e.g. general substitution principles.

$$(\lambda \underset{\sim}{x}\ f\ \underset{\sim}{x})\underset{\sim}{y} \text{ iff } f\underset{\sim}{y} \ .$$

The distinction between functions and their values is important for the integrity of the location criterion. For a function may depend on a temporal (or spatial) value and its value vary over time. But the variation of the value over time does not imply that the function in the abstract sense varies over time: it does not.

Functions in extension reduce further to classes of ordered pairs and thence to elements of class theory: with intensional functions crucial connections in these reductions fail.

Other abstract mathematical objects. A great many of the myriad of abstract mathematical objects may be defined - have proved to be definable - in terms of the abstractions already discussed. Nothing however prevents the introduction of mathematical objects not so reducible (and a corresponding widening of abstraction principles); for that matter it is not entirely clear that such objects of present study as categories are so reducible (the real situation seems to be that they are reducible but not to Zermelo-Fraenkel set theory). Such further irreducible objects cause no problem per se for the theory of objects; but they can generate difficulties for the criteria outlined for universals. The force of "characterised by abstraction" dissipates if there are no bounds on such a characterisation, because future options are left open. Then there is the apparent problem of abstract objects which vary over time, which there is no excluding given such a loose account of abstraction. There is no problem however if universals are only a subclass of abstract objects, if the criteria for universals can operate independently, as it seems they can.

Assertions and propositions. The abstraction principle

$$(Pp)(p \text{ iff } B),\ p \text{ not free in } B,$$

delivers an assertion for every wff admitted. Naturally no one-many feature analogous to that for attributes and classes ensues for assertions (since p occurs solo on the left hand side of the biconditional). Assertions are a generalisation upon propositions (see Slog). Provided B is significant (and otherwise well behaved), the abstraction principle yields a proposition - given, what can be guaranteed, that appropriate identity conditions also govern the objects yielded. Assertions and propositions are themselves objects which stand in relations, an important class of which are specified by a special case of the attribute abstraction scheme,

$$(P\Psi)(p_1, \ldots, p_n).\ \Psi(p_1, \ldots, p_n) \text{ iff } A(p_1, \ldots, p_n),\ \Psi \text{ not free in } A.$$

Ideals and essences. The main grammatical form is 'the α' where α is a general class or relation term. However in some cases 'the' is omitted, e.g. Space, Man, Nature. The logic of ideals has not been seriously investigated and remains somewhat obscure.[1] It is one thing, then, to argue that ideals are readily included in a theory of objects; it is quite another having included them to determine their logical behaviour, e.g. the exact axiomatic constraints on them. But this much of logic is clear enough:

if every thing which is (an) m is f then the M is f (Ideal scheme).

It is also clear that this scheme cannot be satisfactorily expressed using existentially loaded quantifiers and extensional connectives. For example, if all existing objects of a species, or all that ever did exist, were defective and had as a result a defect g it would not follow that their ideal had defect g. Differently, the sides of every actual triangle have some thickness but the sides of the Triangle do not. However the scheme can be expressed thus:

if $(x)(xm \rightarrow xf)$ then (the M)f .

The self-predication property of ideals, (the M)m, is immediate. The scheme is an abstraction scheme; (unless counteracted by other principles) it strips away features of particulars that are not shared by other particulars of the given sort.

A frequently proposed elimination of ideals fails because the converse of the ideal scheme is false. There are a variety of counterexamples. Defective objects are one source, e.g. the Fox is four footed does not materially imply that the local chicken-snatcher is four footed. Historical and intensional features are another source, consider, e.g. the Wheel was invented in prehistoric times; the Aeroplane has a short history; the Moa is extinct. Such features of ideals separate them from essences, which are incomplete objects which have just the essential features of the respective classes they represent and no other extensional properties. Ideals satisfy further conditions, which it is not so easy to state precisely; for example, the following requirement (which is not a pure abstraction feature):

if f is a general feature of the history or evolution of ms then
(the M)f (Factual scheme).

This scheme has to be carefully applied (which shows the serious limitations in its formulation). It will not do to argue, as is commonly done: some horses exist (this is a feature of horses as opposed, e.g., to dodos), therefore the Horse exists. Ideal objects, being seriously incomplete in determinable features and having no determinate spatial location[2], do not exist (see further chapter 9). What used to be said of the Triangle, before the sweep of modern platonism, is instructive, namely that though some triangles do exist the Triangle does not, because, for example, the lengths of the sides, the sizes of its angles, are indeterminate. The point to be made by the assertion "the Triangle is actually exemplified" or "Entities exemplify the Triangle", where

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[1] Not only the logic, but the grammar, has its murky reaches. Not all common nouns yield ideal terms, in particular mass terms do not (consider 'the Water', 'the Footwear', 'the Gold'; but 'the object Gold' is in order). Which nouns do yield ideal terms, and is there a rule for 'the' deletion?

[2] The Spatial Object has a spatial location, but not a determinate one.

x exemplifies the M iff x is (an) m.

Seriously defective objects of a type are bad exemplars; paradigms are excellent exemplars.

Naturally ideals, essences and properties are not disconnected. One of Plato's phrases 'the form of' can perhaps be viewed as a conversion operation taking ideals or essences into properties, e.g. goodness is the form of the Good. Form of can in fact be defined, to make the connection analytic, in terms of the following: f-ness is the property of all and only those objects which exemplify the F, i.e. $\lambda f = \lambda x$ (x exemplifies the F), an immediate consequence of the definition of exemplification.

The abstractions considered by no means exhaust those that are common in modern philosophy, or that have been deployed in this text. One important omission from the listing is this:

Objectives, state of affairs, abstract events, and worlds (in one sense) are somewhat propositional-like objects; they differ however from propositions (as is explained, 12.3).

Although the general outline of a noneist theory of universals has been given, how it escapes or resolves the main traditional problems explained, and what the logic of various sorts of universals looks like indicated, the point of a theory of universals, and the need for universals, has not been explained so much as taken for granted. These matters do not have to be taken for granted: traditionally they were explained. The need for universals in logical discourse, and in the corresponding ordinary discourse logical discourse formalises, was already observed in chapter 1, e.g. in the expressive inadequacy of quantificational logic for various purposes. The necessity for universals (of some sort) in science,[1] although it does not admit of quite such a decisive proof, is no less evident (and can be proved on weak assumptions). The main point of a theory of attributes is to offer some

> account of the relation between a predicate term and those terms which it may be used truly to describe or to clarify. And the characteristic form of the solution is to introduce some third item which links the words to the items and stands in relations to both. The tokens mean the same because they are related in the same way to the constant universal; while the items, though different ..., may be said to be the same in a given respect if they are related in the same way to the unchanging universal (Slog, p.197).

A synthesis of apparently different theories of universals may be effected (as is explained in Slog) within such a schematic framework.

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[1] It was much remarked upon by some who would have been the first to rid scientific discourse of them, had they been able, e.g. Bentham in Ogden 32, Vaihinger 49.

§10. *Illustration 2: Perception.* What is argued, by way of second illustration of the importance of noneism, is that only a noneist[1] theory can provide, through its treatment of inexistence and intensionality, the logical foundations for a direct realist theory of perception, according to which observation (similarly, perception and its cases such as smelling and touching) is a relation between an observer and an object, commonly an ordinary item in the real world, and commonly also the item it seems to be; e.g., when a person observes an antechinus what he sees and is related to directly is an antechinus and the relation proceeds through no intermediaries such as ideas, concepts, contents, beliefs, sense data, images, etc. All these parasitic middlemen are bypassed and rendered redundant.

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[1] The switch from Meinongianism to noneism is deliberate: and it is important (as well as marginally reducing dissonance). For a theory of objects, though of a Meinongian cast, can facilitate or lead to views incompatible with those Meinong held; in particular noneism enables a direct realist theory of perception, a theory that conflicts with the sort of theory of perception Meinong adopted which was a theory of content and object. Meinong reached his theory of objects by way of a kind of indirect realist theory of perception (deriving from Brentano and Twardowski); but having subsequently attained the theory of objects Meinong never went back and revised his theory of perception so as to remove intermediaries, i.e. contents.

The direct realist theory being sketched out is more like the commonsense theory of Reid (1895, especially p.367 ff), who also accepted central noneist assumptions. But though the account given has much in common with Reid's account of conception, it differs in crucial respects from his account of perception. For firstly, Reid, like Meinong, insisted - without however anything much in the way of argument - that perception is always of what exists. Secondly, Reid had an account of perception (of very doubtful merit, as will be brought out by implication), which appears to clash with a direct theory.

> Reid has an analysis of perception into a complexity of sensation, conception and belief. Without needing to know any more about it at the moment, we can see that it will not fit easily into a theory of direct perception. (Grave 60, p.30)

The account, which is not descriptive of perception, is this:

> ... to perceive a physical object is to have the 'conception and belief of it' 'suggested' to us by the sensations that we have from it. Reid says that he has no theory of perception, and Stewart says that Reid has no theory of perception. They mean that Reid's account of perception is nothing more than a straightforward description of the central facts involved by the constitution of our nature in perception, and that the inexplicability of the connections between these facts is recognised by Reid and left untampered with by conjecture. (Grave, p.161)

The thesis to be argued turns on a moderately sharp characterisation of direct realism. (If you want to mean something less direct or less realistic by 'direct realism' then call the notion to be characterised 'real realism'.[1]) What is not direct realist, on the account adopted, is a theory which abandons direct realism in problematic cases, e.g. where perception is not veridical, the object perceived does not exist or is not as it seems to be, or where the perception predicate is not transparent. Armstrong's so-called "direct realist" account of perception (in 61) in effect abandons a direct realist theory for problem cases (i.e. cases where inexistence or intensionality creates trouble) and supplements it with a different account which involves a translation or analysis for these cases.[2] Thus it is not a genuine direct realist theory. By contrast, a noneist position also provides a direct account for "problem cases". According to Armstrong (61, p.xi, my arrangement: the main points are repeated on p.24):

> ... the main question asked about perception in modern western philosophy is 'What is the direct or immediate object of awareness when we perceive?' Direct realism answers that the immediate object of awareness is never anything but a physical existent, which exists independently of the awareness of it.

The characterisation is both too strong and too weak. It is too strong because of the requirement that the object perceived is always an independent physical existent: it is enough that it sometimes, or commonly, is. And without this weakening there is a false contrast in the main positions presented, because the alternatives Armstrong cites, Representationalism and Phenomenalism, hold that the immediate object of awareness is always some sort of sense-impression, and often not what seems to be directly perceived. The characterisation leaves only the following sorts of options where perception is not, as it sometimes is not (e.g. in hallucinations), of existents:

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[1] It is a serious question whether the noneist theory of perception presented should be accounted a realism at all. If realism always involves, as Bunting 72 assumes, the existence condition, that what is perceived exists, then the noneist theory is not realism. The usual classification of positions is then - being thus referentially based - inadequate, as Bunting finally suggests (72, p.89): for the noneist position is neither realist (in this sense), phenomenalist, representationalist, nor sceptical. The Bunting way of putting things, which is certainly viable, would have the advantage of maintaining the parallel with the theory of universals - where the noneist position is not a realist one, in the sense almost always adopted in that setting of being platonistic - and also of maintaining the new broom image of noneism. It is very doubtful however that realism, as ordinarily understood in perception theory, does involve the existence condition.

[2] In 68, p.227, Armstrong weakens his claim to have given a direct realist account:

> Perception is a two-term relation holding between the mind and a portion of physical reality. It is this view that it is natural to call a 'Direct Realist' theory of perception, and I now think I said something potentially misleading in Perception and the Physical World when I spoke of my own theory as a form of Direct Realism (my italics).

(i) the rejection of such cases as either not occurring (a version of the "naive" theory) or as not perception, because not successful. But if not perception, what is it? This leads to

(ii) analyses of such cases, and shifts to some indirect theory in these cases. Armstrong tries to contend that such cases are not cases of perception (except in inverted commas senses) and offers an indirect - and rather unsatisfactory - account in terms of the acquiring of false beliefs or else of inclinations to false beliefs.[1]

The characterisation is also too weak, because there is no requirement to the effect that the external entity is commonly (i.e. in veridical cases) what it appears to be. Armstrong's characterisation allows as direct realisms many positions, which are far removed, e.g. weird monisms where the one object of perception is always the primeval substance. An improved characterisation of direct realism, avoiding these objections, is as follows:-

> Perception is a direct relation - the relation implying, in particular, awareness, and directness implying immediacy, i.e. that there need be no intermediary objects - between a sentient object, a perceiver, and a usually independent object, the thing perceived, which commonly (specifically, in veridical cases) exists and is as and what it appears to be.

But the object perceived may not exist, and it may not be exactly as it appears. The latter nonreferential features of perception are crucial to an adequate theory of perception.

Many features of perception fall into place naturally when viewed as applications of logical theories of inexistence and intensionality. Both aspects of nonreferentiality prove to be very important in epistemology. Firstly, and more controversially, that an object is perceived does not imply that it exists[2]; perception predicates can truly relate nonentities to entities: a person can see an oasis where none exists, can observe two candles when only one or none exists, can seem to hear a vehicle approaching when none is actually approaching, and so on. Blake actually saw 'those wonderful originals called in the Sacred Scriptures the Cherubim'.[1]

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[1] On what is wrong with this account, and, more important, how the route to it which depends on using Meinong as a bogeyman, traces of whose theory are to be avoided at all costs, see the discussion of sensory illusion below.

[2] Like most isolated ideas in philosophy - especially those that simply copy what is often, or sometimes, said outside philosophy (as does even the reaction to paradox arguments: 'Well then, that's a true contradiction!') - this is not the original gem one may at first have imagined. In this case, the initial embarrassment lay in finding that one had thought of it oneself more than 10 years earlier, the further embarrassment in discovering that many others had toyed with the idea many years before that, e.g. Moore and Smythies. Still the idea has not reached the ordinary professional philosopher, and it is not uncommon to encounter such gratifying reactions to it as 'That really blows the mind'. Maybe, since the idea is not unfamiliar outside philosophy, philosophers' minds take less blowing than most.

Consider, first, to recall the complete naturalness of such usage of perception terms, Moore's description of his negative after-image experiments given in his "Proof of an External World' (59, p.131; my italics):

> ... I did find that I saw a grey patch for some little time - I not only saw a grey patch but I saw it on the white ground ... each of those grey four-pointed stars, one of which I saw in each experiment, was what is called an 'after-image' or 'after-sensation'; and can anyone deny that each of these after-images can be quite properly said to have been 'presented in space'?

Several other examples of this sort (some drawn from Gregory 66) are assembled in Bunting (72, p.84; my rearrangement):

> (1) When I look at a bright light and then close my eyes slightly, I see shafts of light radiating out from the bright light. ... (5) pressure on the eye makes us see light in darkness .... (2) By focussing my eyes on that spot eighteen inches in front of me, I see two spots, and not just one. (3) When a small part [of the brain] is stimulated a human patient reports a flash of light. Upon a single change of position of the stimulating electrode, a flash is seen in another part of the visual field .... Stimulation of the surrounding regions of the striate area also gives visual sensations .... Brilliant coloured balloons may be seen floating up in an infinite sky.

In each case 'see' is used (as Bunting contends, against Chisholm) in an ordinary, and indeed normal, sense.

Secondly, important examples of perceiving what does not exist are afforded by visions and hallucinations. Indeed hallucinations are sometimes characterised (too generously) in terms of perception of what does not exist:

> Persons who have hallucinations of sight see things that do not exist; persons who have hallucinations of smell smell odors that do not exist (L.P. King, in Kaplan 64, p.143).

Striking and well-documented examples of such hallucinations are provided by accounts of drug taking and schizophrenic experiences. For example, often in schizophrenia, 'the patient has trouble walking because what he feels [touches] and sees is not really there' (OP, p.422). Or consider how Perceval subsequently described his experiences - he does not hesitate to use, nor need he refrain from using, ordinary perceptual terms such as (parts of) 'hear' and 'see' -

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[1] Blake, Descriptive Catalogue; cited in the above form, without any qualification on 'actually saw', in Huxley 59. Huxley gives many other examples of perception of what does not exist, and an interesting (if disputable) theoretical background to, and comparison of, the experiences of mescaline takers, visionaries, and schizophrenics.

> During this year, also, I heard very beautiful voices, singing to me in the most touching manner - and on one occasion I heard the sounds of the cattle lowing and of other beasts in the fields, convey articulate sentences to me, as it is written of Balaam. On another I was threatened terribly by the thunder from heaven - in short, nearly all sounds that I heard were clothed with articulation. I saw also visions, and the same day that I heard the cattle addressing me, on looking up into heaven, as I was leaving Dr. Fox's premises, I saw a beautiful vision of the Lord descending with all his saints. During the same year, I also saw the faces of persons who approached me, clothed with the features of my nearest relations, and earliest acquaintances, so that I called out their names, and could have sworn, but for the immediate change of countenance, that my friends had been there. (in Kaplan 64, p.336).

The examples given, and others like them that may be assembled, serve to show that

> ... in actual English usage, the words <see>, <look>, <hear>, etc., are used to describe hallucinatory sense-experiences as well as veridical ones. I am not referring here to people whose wits are bemused by drink or delirium who, it might be claimed, were no longer in a state to observe properly or to adhere to correct English usage. I am referring to the extensive factual evidence available in the reports of those experimental subjects who have taken mescaline. These subjects can of course distinguish between their hallucinations and their veridical perceptions but that is not the point. Philosophers who claim that it is only correct to say that we see physical objects (we must say that we 'have' hallucinations or some such) have not studied what people who are having hallucinations under such experimental conditions actually say. The only criterion for correct usage in English is to find out what most people in the circumstances under consideration in fact say. Since people describing their hallucinations almost invariably say 'I see' and not 'I seem to see' or 'I have', it is as much correct English usage to say 'I saw a flower' when the flower was hallucinated as when it was a botanical flower. A study of what people say when they have hallucinatory experiences of the type called apparitions yields the same results; e.g. 'I saw him as clearly as I am seeing you now.' Therefore seeing cannot simply be taken as a perceptual relation between people and [existing] physical objects; for it is not the case that, in all instances of seeing, it is physical objects that are seen (Smythies 56, p.32).[1]

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[1] The quote in fact begins 'Unfortunately, however'. Smythies, himself a victim of referential assumptions, presents the evidence as a reason for introducing 'the complications of the sense-datum terminology' (p.31). The evidence does not, on its own, support the introduction of sense-datum or idea terminology (as will become evident); it would only support that given the further (mistaken) thesis that the basic perceptual notions must be appropriately referential.

Nevertheless a concerted attempt has been made, even by "commonsense" and "ordinary language" philosophers, to erase such correct ways of describing these events, to turn all perception statements into what comprise only proper subclasses of these, into so-called success or achievement (or else tentative or quasi-success) expressions, which imply or presuppose existence - and to bully students out of using familiar "nonsuccess" locutions. (The "success" and "achievement" terminology is loaded: it suggests - what is often false - that perceiving what does not exist is unsuccessful.) The attempt parallels, really it is an extension of, what it is supported by, modern logical attempts (e.g. in theories of descriptions), to convert all nonreferential (Sosein) statements to referential (Sein) statements.

A recent illustration of the lengths to which philosophers are prepared to go to try to enforce referential uses of perceptual discourse to the exclusion of correct nonreferential discourse, is in Dretske 69 (p.43 ff.). Dretske, like sense datum theorists, goes to some considerable trouble to establish a basic sense of 'seeing', what he calls 'seeing' which is fully referential, i.e. existentially loaded and transparent in the second place. Now nothing stops the introduction of such a sense: a referential sense of 'see', 'see^R', maybe defined thus (using classical notation):

$$\text{a sees}^R \text{ b} \equiv \text{a sees b} \;\&\; \text{bE} \;\&\; (\forall z)(z = b \supset. \text{ a sees } z).$$

Although a sees^R b implies a sees b, the converse does not hold; introduction of a referential sense of seeing provides no guarantee that "a sees b" implies "b exists". But in the course of his exercise with 'seeing^n', Dretske claims and tries to show that seeing, in the ordinary sense, is a success notion, that to see a entails that a exists (the existence condition). His first move is typically philosophical, that of shifting the burden of proof. He asserts (p.43) that the manner in which he has characterised his nonepistemic seeing, seeing_n, provides us with an existential implication:

> if a sees_n b then there exists a z (having name or description 'b') such that a sees_n z.

This is not so, without further ado tantamount to imposing the existential requirement. For according to the characterisation (p.20),

> S sees_n D = D is visually differentiated from its immediate environment by S.

Moore, who saw (i.e. saw_n) a grey afterimage, visually differentiated it from its immediate environment, but the existence of the afterimage hardly followed therefrom, for reasons Moore gave. (Similarly with Bunting's examples.) Thus the characterisation of 'sees_n' no more implies that existential generalisation holds than the relation of seeing guarantees such generalisation. Dretske would deny this: while he admits

> Nothing I have said about seeing_n ... rules out the possibility of seeing_n after-images, spots before one's eyes, and hallucinatory rats,

he goes on to claim

> in each case these elements must exist in order to be seen (p.46).

This is to assume the point at issue, to apply the existence condition to determine what exists. However what exists is quite differently determined, with the common result (argued for in the next chapter) that afterimages, spots before the eyes of the concussed, and hallucinatory objects do not exist. Even Dretske, despite his commitment to the existence condition, has doubts about whether hallucinatory rats and hallucinatory daggers he claims must exist do exist (see his note, p.46); and of course they do not, such is the point of the modification 'hallucinatory'.

In any case (as Dretske concedes, p.46), the attempt to enforce the existence condition does not meet the hard cases, that is cases where a and others claim that a sees b, where b does not exist and a and the others know this but refuse to withdraw the perception claim. Dretske's ploy is to try to assimilate such cases to those where we are prepared, in the given contexts, to supply an intensional covering functor. The argument is by analogy, the analogies relied upon comprising examples from fiction where we are prepared to introduce such functors as 'Once upon a time', examples of dreams where 'we preface the narrative with the words 'last night I dreamed' [and] there is a suspension of certain standard implications' (p.47), examples involving reports of very unusual situations - the miner trapped for weeks in a dark mine shaft 'who reports having seen the most fabulous cuisine set before him' (p.48, my italics), wild lions in the street - where the reporter is willing to preface his remarks with 'It is just as though' (p.49). Dretske claims that, in the same way, in the hard cases the speaker and the rest of us are willing to supply such covering functors as 'I seem to see' or 'It seems that' and to do, what this permits, suspend standard implications, such as (you guessed it) the existence condition. Many of us and many speakers are, for good reasons, not willing to do so: so even where the basis of the analogy is good,[1] the analogy breaks down. For consider what Dretske is obliged to say in one of the hard cases where an object is reported as seen (p.49):

> Obviously the context in which the report is being made already functions to make this qualification (prefacing what is said with 'I seem to see') apparent to everyone.

This is not obvious because it is not so. No qualification may be required, so the prefatory qualification will hardly be apparent to everyone. Indeed it may be apparent that to impose such a qualification is a mistake, and would result in misdescription: for many of us are aware of the differences between seeing and seeming to see (in the common sense where the latter implies not seeing), and appreciate that cases of seeing where the existence condition fails are not properly relocated as cases of seeming to see. (In fact serious theoretical distortion can result from attempts to relocate these cases to render the existence condition true, as explained shortly.) The existence condition is not a standard implication which can however be suspended in exceptional circumstances provided intensional cover is understood; to assume it is is to assume again the point at issue, and to assume a case of the Ontological Assumption. There is no such standard implication on the ordinary sense of 'see'; to impose the condition is to write in a theoretical condition drawn from a mistaken theory (which takes the OA as a norm).

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[1] The basis is in doubt in fictional cases, where often we are not prepared to cover statements, e.g. to trade in 'Mr. Pickwick was portly' for something of the form 'O (Mr. Pickwick was portly): see especially chapter 7.

The issue reduces, in fact, to whether intensional cover has to be supplied. For Dretske concedes (p.49) that the existence condition can be suspended by linguistic or nonlinguistic signals, devices, and other means; in such cases the existence condition would fail unless cover were supplied. But suspension of the condition does *not* imply that cover is presupposed. Suppose a speaker who had been hallucinating reported that he saw remarkable flowers but also indicated that he was aware that no such flowers existed. The signal suspends the existence condition; thus the condition fails unless cover is supplied. But correct usage of 'saw' (Dretske's '*one* sense of the verb';) does not require any such cover; and to impose a cover such as 'It seemed that' would falsify much data.

For consider again usage: asked what one sees or hears in an hallucinatory situation one can truly answer: I am looking at two candles and I hear them burning; I see the stars symmetrically arranged and so close that I could touch them. More generally, the answer takes the form $a\phi b$ where, a is sentient creature, ϕ a two-place perception predicate, and b a non-existent object. Such claims may be true: one sometimes sees something that does not exist: indeed sometimes one can know that it does not exist even though, or while, one sees it. Moreover, however hallucinatory phenomena are described, given sufficient detail we can *define* perception predicates, like the usual *non*success predicates, in terms of these. The natural description of hallucinatory perception is commonly that of seeing, hearing, or otherwise perceiving, what does not exist. Note that such experiences cannot be accurately described as 'imagined hearings, seeings, etc.' They are quite genuine, and not *imaginary*, experiences of hearing or seeing certain items. When people such as Perceval recover, they do not renounce their claims to have heard and seen the things they did hear and see, they renounce their *belief that what they perceived was something in the actual world*. It is not the experiences which are unreal or imaginary but the items so experienced.

The natural way to describe such perceptual experiences, then, is in terms of perception of a nonentity, as a genuine perceptual experience of something which has no existence in the real world. Nevertheless the pressure of referential accounts of perception leads to the ruling out of such natural descriptions, and to the alternative description of such cases, as for example in Dretske, not in the natural way as genuine perceptual experiences of imaginary items, but as imaginary or nongenuine perceptual experiences ('perceived imaginaries' are forced referentially into 'imaginary perceiveds'). According to the referential view, an apparent perception of a nonentity cannot be a genuine perceptual experience; the "perceiver" only seems to see, hear, etc; in such cases it is false that anything at all is seen, heard, etc.

Such an account is an obvious outcome of the referential view of perception, but there are powerful reasons for rejecting it. It is, first of all, fairly clear that to say someone has an imaginary or illusory or otherwise nongenuine perception of something is quite different in meaning from saying that she has a genuine perceptual experience of something imaginary or unreal. It is, for example, not a difficult thing to imagine one is seeing a ghost, but that is not at all the same thing as actually having an hallucinatory experience of one; nor is seeming to see, or thinking falsely that one sees, a White-headed Pigeon at all the same thing as having an hallucinatory experience of a White-headed Pigeon - that is the case where one has a genuine perceptual experience of a White-headed Pigeon which is not an inhabitant of the actual world (i.e. belongs to $d(\underline{\underline{T}})-e(\underline{\underline{T}})$). There are of course imaginary perceptual experiences as well as genuine perceptual experiences of imaginary items, but they are not the same thing: perceiving an imaginary a is not imagining perceiving a. And there are certainly many cases which cannot be properly described in the way suggested.

The motivation for the redescription attempt is much the same as for adverbial theories of intensional notions. The natural description of a genuine perception of something which does not exist would run counter to the Reference Theory and require not only quantification into an intensional context, but nonexistential quantification at that. The redescription transforms this awkward relation between an entity and nonentity into a pure property of an entity, and thereby avoids offending against the Reference Theory. But it is especially clear in this kind of case that the redescription move does not work, that there are important cases which cannot be so redescribed, and that the proposed redescription would eliminate distinctions which are essential for understanding and describing important aspects of the real world. The redescription does not succeed; but it is not just a matter of terminology or of "correct usage", the redescription distorts features of the cases described.

Consider, for example, the perceptual hypothesis in the explanation of schizophrenia as outlined in Orthomolecular Psychiatry (OP), and especially Kirk's paper in that collection. The explanation of schizophrenia preferred in Orthomolecular Psychiatry can be seen as operating on three levels, a physiological level, an experiential level and a social level. The perceptual hypothesis is at the experiential level. This hypothesis explains the behaviour of schizophrenia as resulting from experiences of systematically distorted perception - which is seen as having usually an underlying physiological cause. According to this theory the schizophrenic person may develop a false belief system as a result of his systematically distorted perceptual experiences, and the social interactions this produces; in advanced cases these perceptual experiences include perception of unreal items and hallucinatory experiences. But to explain schizophrenia in this way, to give the perceptual distortion the major explanatory role on the experiential level, is to assume that these are indeed genuine perceptual experiences, and that the development of false belief systems are secondary and to be explained in a fairly natural way by the perceptual experiences hypothesized. That is, the perceptual experiences explain the false beliefs, and not the other way around; and the explanation requires that there are genuine perceptual experiences which do not require further unravelling or explanation on the experiential level (they may be explained at other levels, e.g. physiological). The schizophrenic experience and schizophrenic behaviour cannot be understood, in terms of the perceptual hypothesis, if it is assumed that these distinctive experiences are merely imaginary or false, not genuine perceptual experiences, standing in need of further explanation at the experiential level. Schizophrenic people usually rightly and indignantly reject the suggestion that they merely imagine seeing or hearing the things they do; and when such people recover, as the case of Perceval indicates, they usually do not withdraw the claim to have seen or heard these things, they simply cease to believe that what they saw and heard was real.

These different approaches to perception make a great difference, then, in practical cases. For in the case of the perceptual hypothesis the schizophrenic's false belief system, and the bizarre behaviour often associated with it, is viewed as primarily a consequence of a distorted perceptual experience of the world, and consequently distorted social interactions; and so the belief system may be seen, in a straightforward way, as what it seems to be, primarily a consequence of distorted perception and as part of a reasonable and rational attempt to explain and cope with the world as presented in perception. If, on the other hand, the possibility of distorted perception is ruled out, as it is on referential theories, the schizophrenic belief system would tend to be viewed as prima facie irrational, as an irrational body of imaginary perceptual experiences, inexplicable and irrational beliefs, and bizarre behaviour. Since these are inexplicable when taken at face value, attempts are made to procure rationality through various interpretations, which provide them with a meaning and a reasonableness which would otherwise, on the false perception view, be thoroughly lacking; such approaches thus give rise to a host of interpretation treatments, most of them strained and fanciful. The important point is that referential accounts such as the false belief account appears to rule out the perceptual explanation of schizophrenia, since if cases of hallucinatory perception are not genuine cases of perception, obviously there cannot be any explanation in terms of perception or defects in perceptual apparatus, and if these are merely false beliefs, then they cannot be the explaining factor but only what is to be explained. This may in fact be one reason why this most straightforward explanation of the problem has been overlooked for so long.

The perceptual explanation of schizophrenia may or may not be the most satisfactory explanation among modern explanations of schizophrenia (although there is some reason for thinking it might be, in terms of its ability to account for the data; see Kirk's assessment in OP). It would be ironic indeed if the Reference Theory and associated empiricism, which delight in presenting themselves as the upholders of science and bastions of the scientific approach, should exclude, through their theories of perception, perhaps the best explanation of what has been described as 'the most baffling problem known to science'. But whatever value the perceptual explanation is ultimately found to have, it counts sufficiently against accounts like the false belief account, which include the existence condition, that they rule out such an explanation presumably as illogical before it can even begin, and before it can be tested; indeed they rule out a whole class of explanations in terms of faulty or disturbed perceptual apparatus before they can really begin.

The main motivation for the existence condition (as for the transparency condition) appears to derive from the Reference Theory. But further motivation for the denial of the possibility of seeing or perceiving the nonactual comes from the (mistaken) attempt to view perception as completely paralleling the physical perception process that takes place in veridical cases; for example, seeing is viewed as occurring just when light emitted by a certain object strikes the perceiver's eye in a certain way, and so on through the physiological story (where everything is supposed to proceed referentially).[1] But a nonentity obviously cannot emit light which strikes a perceiver's eye, etc.; so, obviously, a nonentity cannot be seen.

The move amounts to an attempt to referentialize perception, to remove its intensional inexistential character. For the physical relation in terms of which the account is given is extensional (e.g. light striking the observer's eye); so the perception claim, if it is (said) to be true when and only when this extensional perceptual process claim is true, must also be extensional. While the claim that a nonentity cannot stand in the requisite extensional perceptual relation is right, the requirement of such a simple physical relation (either as a necessary or as a sufficient condition) as the basis of perception is wrong. Certainly a physical and visual relation of the relevant kind may be involved, but the requirement interprets this involvement too simplistically. For example, an hallucinatory experience, e.g. of a ghost, may be described in terms of an 'as if' or a counterfactual physical relation (his optical equipment was affected in much the same way as it would have been if it had in fact been a ghost; it was as if he had seen a ghost); but the counterfactual or conditional part of this is firstly irreducible, secondly makes the matter irreducibly intensional (for look at descriptions which can be substituted in as if contexts), and thirdly, removes the case for the restriction of perception to actual items, since this new counterfactualised relation can as easily relate a nonentity (as perceived) to an entity (as perceiver) as an entity to an entity.

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[1] Thus, for example, Chalmers 76, p.22 ff. Criticism of this position is taken up again in 11.3.

The usual extensional attempt tries to restrict cases of "real" perceiving to the extensional case, setting the 'as if' or 'counterfactual' visual process observations aside as imaginary perception, as not genuine perception. This should be rejected, for the reasons given and others (to be adduced). What has to be given away is not however the physiological story of perception but the simple-minded extensional account of perception.

In a similar vein, it is sometimes objected to direct realist theories of perception that they do not allow for, or indeed are incompatible with, the causal story of perception which modern science has revealed. The weaker claim may be found, for example, in Hirst 67 (p.80), the stronger claim in Smythies 56. Hirst's line is that 'some attempt has...been made [by common sense realists] to deal with the causal processes, but not very convincingly'. For they (usually linguistic analysts)

> have said little of a positive nature; their main attitude is that the causal processes are at most only the conditions of perception and are the concern of the scientist .... Unfortunately, scientists generally claim that the study of the causal processes requires representative realism, and even if the plain man does not bother about them, an adequate philosophical theory cannot ignore the causes and conditions of perceiving, particularly since the explanation of illusions depends on them (Hirst, p.80).

While it is true that an adequate theory cannot ignore the conditions of perceiving - some of which have but little to do with causal processes - and that the sharp separation linguistic analysts have tried to impose between common sense philosophy and science is artificial and implausible, convincingly dealing with causal processes (insofar as they are presently known) can be satisfactorily expressed in the language of common sense. The scientists usually arrive, like Hirst, at a representative theory for (bad) philosophical reasons; they 'are persuaded by the argument from illusion' and through uncritical adoption of a referential model of perception. And despite the claims of some scientists, it false that a theory of the causal processes requires representative realism. Smythies is not unrepresentative of "the scientists".

Smythies objects (56, p.31) to the common speech common sense account of perception,

> we will not be able to give any logically coherent account of how the physical and physiological processes concerned in perception are related to my visual experience. For to attempt to do so along these lines leads us into the logical fallacy discussed in (3.1).

The fallacy alluded to is led to by

> the theory of perception known as naive realism .... For it is clearly a logical fallacy to state that a series or class of events with a temporal duration of three hundred years [obtained in perceiving a star at the appropriate distance] is identical with a series or class of events with a temporal duration of three seconds [sensing a sense datum related to the star]. Yet the theory of naive realism states that ... [These two series or classes] are identical (p.15).

Even if the naive theory did state this - which is decidedly doubtful - such a naive theory is not implied by common speech common sense accounts of perception.[1]

It is not the case that the causal story of perception as so far revealed by modern science is incompatible with direct realist theories of perception. In trying to show this, it helps to separate what may be called the physiological story - which is the account, with theoretical components, of what happens in perception of various sorts - from the causal theory of perception, a competing, philosophical theory, which, unlike the physiological story with which it tries to associate or identify itself, is (at least as usually presented) incompatible with real realism.

> The causal theory of perception, can be taken as holding that an observer, O, perceives an object, M, only if M causes O to have sense impressions (Donnellan 74, pp.18-9).

But consider any case where a perceives M and M does not exist; since M does not exist it cannot physically cause any reactions in an existing perceiver a. Hence real realism entails the falsity of the causal theory, so (conventionally) formulated. To be sure, the causal theory can be modified so as to be rendered compatible with realism[2]; e.g. Donnellan's formulation is first restricted to "veridical" perception, and a further clause is added to account for remaining cases. But taken literally the causal theory is false; for the pomegranate flower I am inspecting does not cause me to see it.[1] Moreover the causal theory, even treated more sympathetically, characteristically imports so many suspect philosophical middlemen (such as sense impressions, in the technical sense of sense data or Humean impressions) in an essential way that it is best abandoned. Abandoning the philosophical theory does *not* imply abandonment of the physiological story, which if satisfactorily presented need say nothing about sense impressions and little, if anything, about causes in general. The important point for the synthesis of the physiological theory with noneism is that the story *need not* (though it may) commence with an external entity which vibrates, emits or reflects light, or whatever: it can begin with what happens in an observer's head. Consider the patient who sees brilliant balloons floating up in an infinite sky (example (3) above): the physiological story, most details of which are unknown, starts with small electrical charges being sent through a probe inserted in the striate area of the patient's brain.

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[1] It is surely false also that 'the class of events denoted by the phrase "I perceived a star"', in the context of a star at 300 light years distance, is 'a class of events with a temporal duration of three hundred years'.

[2] As the causal theory of names was adjusted in chapter 1, §14, to permit a synthesis with noneism. In general, causal theories of any sort, which work for a restricted class of cases, can be combined with noneism by being restricted to those cases. The usual trick of causal theories is of course to pretend to universality when only referential cases are covered; i.e. the success of the theories presupposes the Reference Theory.

How is the correct physiological story, considered as a conjunction S_p, in the case where a sees b which does not exist, reconcile with statement p, that a sees b? In the same way as when b does exist: if the story is adequate, $S_p \equiv p$. But the connection is a contingent one; p neither entails S_p (consider, e.g. the situation Dretske describes in 69, chapter 1, where a man regularly sees what happens in the other side of a massive quite opaque wall), nor is entailed by S_p. Hence, as expected, the meaning of perceptual predicates cannot be given in physiological terms; for if it could, such entailments would follow. So too someone's knowing p does not entail that he knows S_p, since a material equivalence does not license replacement in intensional frames. But isn't to see, for example, the same as to have certain physiological processes going on? Yes, presumably; but the identity is a contingent extensional one, not a logical or intensional one (a much fuller account of the matter is given in Routley and Macrae 66). Thus familiar problems that confront, and are sometimes claimed to invalidate, referential realist-style theories over the connections of perception and physiological processes (e.g. how they can be the same when the logical properties and meanings differ: $a = b \mathbin{\&} {\sim}\Box(a = b)$) simply dissolve under the nonreferential identity theory (explained and defended in chapter 1).

The second, not uncontroversial, facet of the non-referentiality of perception is referential opacity of perceptual terms: $a\phi o$ and $b = c$ does not guarantee $a\phi c$. For example, a looked for (looked at, noticed, was aware of, saw) a speckled hen does not materially imply, even though the hen is one with 999±7 speckles, that a looked for (etc.) a speckled hen with 999±7 speckles. The basic verb 'aware' of much perception theory is conspicuously opaque, especially in *that*-constructions (to which theories often try to reduce *of*-constructions); for instance, to adapt a famous example, George IV was aware that the author of *Waverley* wrote *Waverley* but was not aware that Scott wrote *Waverley*. To be sure, transparent analogues of opaque predicates can be readily enough designed (e.g. using the English 'in fact'), much as existentially-loaded (success) versions of unloaded predicates are easily introduced. But these analogues do not replace, or remove the need for, the opaque unloaded originals. Moreover the needed opaque originals are not so easily recovered from their transparent analogues - or recoverable at all in a classical theory of the modern extensional sort.

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[1] This is one reason why reformulations of the causal theory like the following (suggested by what Dretske has to say in 69) fail:

> if x sees y then some (further unspecified) causal chain links y with x.

To fit with noneism of course, y should be replaced by some $\delta(y)$ which exists, otherwise causal linkages of nonentities with entities remain.

The restriction of perception terms to "success" terms is only the first then, of restrictions designed to turn perception relations into honest-to-God referential relations. Not only are we invited (as by Armstrong, Chisholm, Dretske, and others, including some like Reid and Meinong who should have known better) to reject inexistential perception relations; we are also invited (as by Dretske, Kripke, Quine and others) to reject opaque perception relations.[1] We are encouraged, especially through incompleteness or "facade" arguments, to render our senses of perception relations less subject to incompleteness and properly transparent. Thus, for example; when we see Mr. Jones going down the street by seeing Mr. Jones' head bobbing along the top of the hedge, what we are invited to say - all we are said to really see - is that we only see Mr. Jones' head.

Much as the inexistential character of some perception claims is important in - a crucial component in - meeting sceptical arguments from cases of nonveridical or nonstraightforward perception - for example, arguments from illusion, verification, time gap - so the opacity of many perception claims is important in meeting this other class of sceptical arguments, namely those from incomplete evidence, perspective dependence, Gestalt shifts, and the like, and also the more comprehensive class of arguments directed against realism, e.g. arguments from causation and from the composition of matter. Consider, for example, the latter argument:- put crudely, the argument is that were Simple Simon to directly see a mangosteen then, since a mangosteen is nothing but a certain collection of elementary particles (m = cc for short), he would directly see the collection of elementary particles, which of course he doesn't, so he doesn't directly see the mangosteen. But in the common opaque sense of 'directly see' the extensional identity m = cc does not legitimate replacement of 'm' by 'cc' in 'SS directly sees m'; and in the transparent sense of 'directly see', expressed in English by such locutions as 'in fact directly see' (and formed logically by such constructions as $(Px)\ [m = x\ \&\ SS \text{ directly sees } x]$[2]), where replacement is legitimate, SS does in fact directly see the collection of particles. Resolved along essentially similar lines (as we shall see) are several other difficulties in the theory of perception, e.g. the independence and relative completeness of objects when perception itself is incomplete and sense dependent, and the problem of how perception claims can go beyond immediately observed features, beyond the apparently given. Indeed it is perhaps not going too far to claim that most of the sceptically-based arguments which are supposed to discredit direct realist theories can be met by drawing attention to the intensional and inexistential features of objects of perception. The underlying reason is that the Reference Theory is the main force behind scepticism, especially epistemological scepticism.[3]

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[1] The invitation is a bit like one from the mafia or the state to join its latest insurance or licensing scheme. Not accepting it is taken to spell trouble.

[2] The requisite distinction cannot be made adequately in classical logical terms.

[3] Thus it is that more honest thinkers committed to the Reference Theory, such as Russell, find some of the sceptical arguments valid, and rather irresistible.

(Footnote [3] continued on next page)

8.10 THE INCOMPLETENESS OR FACADE ARGUMENT

Since the sceptical arguments are commonly turned against direct realism, in the first place to destroy directness and realist conditions and to argue for intermediary entities, it is worth a further detour to see how the more difficult of these arguments can be defeated[1].

Perhaps the most telling of the sceptical arguments against direct realism, and the hardest to rebut, is the incompleteness or facade argument. The argument is difficult to rebut because, among other things, it is usually incompletely formulated, so that crucial premisses are hidden from view. The following detailed formulation of the incompleteness argument against direct realism represents a class of sceptical arguments which depend upon Leibnitz identity and ultimately on the Reference Theory. The argument leads to the conclusion that, given classical logic and especially Leibnitz identity, we cannot both admit an obvious intensional feature of perception, namely its incompleteness or selectivity, in other words its opacity, and make the obvious normal claim about what is perceived, that is, the Direct Realist claim. The argument, which admits of many variations, takes the following form:-

1. When someone, z for example, perceives Mr. Jones, z actually notices only a few of the things about him. Alternatively,

1'. Only a (tiny) subset of Mr. Jones' properties are given in perception in any perception event.

2. By definition, the perceived item is the item with all and only the properties which are actually perceived of the item.

3. So the perceived item (Mr. J*n*s) has only a (tiny) subset of all Mr. Jones' property.

4. But Mr. Jones is the item with all Mr. Jones' properties.

5. By Leibnitz identity, therefore, what is perceived (Mr. J*n*s) is not identical with Mr. Jones.

6. Generalising, by the same argument, what is perceived directly is never the real item in the actual world; i.e. direct realism is false.

An alternative conclusion to 5 is

5'. The perceived item (Mr. J*n*s) cannot be the same as the real Mr. Jones.

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[3](continuation from previous page)

The reason why Russell thought the sceptical arguments could not be defeated, was because on his and classical logical theory they could not be. Classically they are (virtually) inescapable. The fallacy lies in assuming that classical logic is the one true logic, and reflects the ways we reason. From the viewpoint of noneism the arguments are invalid, and are not particularly difficult to fault.

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[1] No claim to exhaustiveness is made, so the argument for the main thesis linking scepticism and the RT remains incomplete. While the latter argument can, it is claimed, be made good, that would require, what is not attempted here, something approaching an exhaustive classification of

(Footnote [1] continued on next page)

The problem presented by the argument is resolved in noneist theory by distinguishing clearly opaque and transparent senses of 'what is perceived' or 'the perceived item', which the plausibility of the argument depends upon confusing. Formally these are distinguished as

(1) $\iota x\ P_z x$ (the opaque "item"),

that is, the perceived item as defined in premiss 2 as having all and only the properties perceived of the real item; and

(2) $\iota x\ (Py)(x = y \ \& \ P_z y)$,

that is, the transparent sense of 'what is perceived', according to which what is perceived is the item with all and only the properties of the real item.

The argument trades on confusing these senses and the confusion is facilitated, indeed is difficult to avoid, because of the 'item' terminology used. To speak of 'the perceived item', 'the perceived object' and especially of 'what is perceived' is, normally, to speak in sense (2) above. Item, object, and 'what is' talk is referentially transparent, in its normal uncovered use. Definition (1) therefore in premiss 2 (a special case of the notion of 'intensional object') introduces a special and artificial sense of 'what is perceived' or 'perceived item' which is in fact referentially opaque, contrary to the normal convention for using 'what is' and 'item' and 'object' talk. So strong is this convention that 'the perceived item' of premiss 2 might almost be said to be inconsistently specified, since on the one hand the definition specifies it as opaque (sense 1), while on the other the use of 'item' terminology specifies it as transparent (sense 2).

The terminological point does not get to the bottom of what is wrong with the argument however. The confusion in terminology merely encourages us to go on to make an illegitimate identification between sense (1) and sense (2) which is in fact necessary if the argument is to show anything significant, and in particular to count against Realism. For in order for the conclusion 5 to follow in any damaging sense, such a missing identification must be supplied; for in order to count against Realism the conclusion must show that what is perceived in the transparent sense is not identical with Mr. Jones. But this it cannot do, without the addition of a further premiss 4' - false on the noneist theory - which states that the perceived item as defined in premiss 2 is, in a transparent sense, 'what is perceived' as in the conclusion 5; that is, which illegitimately identifies senses (1) and (2) above. Without such a further premiss the conclusion does not follow if 'what is perceived' in the conclusion is read in the usual transparent way, and it is only if it is so read that the conclusion is damaging to Realism.

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[1] (continuation from previous page)

of prevailing sceptical arguments. However some of the omitted sceptical arguments are considered elsewhere, e.g., arguments from fallibility in 11.4, or are touched upon elsewhere in the text, e.g. arguments from infinite corrigibility and revisability. Valuable investigations of some of the omitted arguments can be found in Wisdom 52 and Griffin 78a.

The argument then faces a dilemma. *Either* it must supply a further premiss (premiss 4': What is perceived is the perceived item) identifying 'the perceived item' in premiss 2 with 'what is perceived' in step 5, a premiss which the noneist will reject, *or* the conclusion does not follow in any sense which could be damaging to Realism. For without such a reading of the conclusion all 5 (likewise 5') states is that the transparent 'item' is not identical with the opaque one. But this is a perfectly harmless conclusion, which the realist can admit, and in fact it simply restates the initial points concerning the incompleteness of perception, in a misleading and tortuous way (misleading because uncovered 'item' talk is naturally transparent). The argument purports to falsify Realism, but in fact there is nothing about the conclusion that the opaque item differs from the transparent one which is inconsistent with a realist position.

The argument is resolved for the noneist then by the distinguishing of opaque and transparent senses of and 'what is perceived', 'the perceived item' which correspond to opaque and transparent senses of perception. It is important to note however that this way out of the problem is *not* available given the apparatus of classical logic, and in particular Leibnitz identity; for making such a distinction is entirely dependent on the rejection of Leibnitz and the adoption of an account of intensionality and of extensional identity according to which such intensional features do not transfer across extensional identities. Given such an account the class of perceived properties will of course be only a subset of the class of all properties of the item, and the perceived item defined as having just the perceived properties not only can but *must* be distinguished from the transparent item, the item proper, defined, through extensional identity, as having the further properties the item in fact has as well as these perceived ones (sense 2: $\iota x(Py)(x = y \,\&\, P_z y)$). This latter item may, in addition to *all* its other properties, *also* have the property of being perceived, in which case it is 'the perceived item' or 'an item which is perceived'.

The Leibnitz identity principle, on the other hand, prevents such a distinction and forces the disastrous identification of the transparent and opaque items, of $\iota x\, P_z x$ and $\iota x\, (py)(x = y \,\&\, P_z y)$, as is now shown.
1) It is logically true that $P_z x \equiv (Py)(x = y \,\&\, P_z y)$. For $P_z x \supset.\ x = x \,\&\, P_z x$, so by particularisation $P_z x \supset (Py)(x = y \,\&\, P_z y)$. Conversely, for every $x, x = y \,\&\, P_z y \supset P_z x$, by Leibnitz identity. Hence distributing P, since y is not free in $P_z x$, $(Py)(x = y \,\&\, P_z y) \supset P_z x$, completing the proof of 1). Hence 2) $\iota x\, P_z x = \iota x(Py)(x = y \,\&\, P_z y)$; for where A and B are logically equivalent, $\iota xA = \iota xB$ on every standard description theory.
3) By Leibnitz again, the transparent and opaque items have exactly the same properties.

This type of argument, and the Leibnitz identity-Reference Theory logical framework which produce it, forces a choice then between, on the one hand, denying the first premiss and misrepresenting the character of perception as complete and extensional, which yields Naive Realism or a camera or other mechanical account of perception, and on the other hand, accepting the conclusion, which leads to the denial of Realism and the well known unpalatable alternatives of Representationalism, Phenomenalism and Scepticism. This of course is just the choice that modern empiricist epistemology has typically presented. The alternative solution points a way to a realism that does not depend upon denying the intensional character of perception, which is what generates the difficulties of the naive form of realism, and that breaks the false choice created by the acceptance of assumptions drawn from the Reference Theory.

A closely related argument to the incompleteness argument is Hume's argument from perceptual relativity, which runs as follows:

> The table which we see, seems to diminish as we move further from it; but the real table, which exists independently of us, suffers no alteration. It was, therefore, nothing but its image which was presented to the mind (Essay on the Academical or Sceptical Philosophy).

The argument and the larger claims Hume supposes it to support are delightfully dealt with by Reid, who demolishes Hume's sceptical case (see 1895, p.302ff.). Reid dissolves Hume's perceptual relativity argument using a distinction between real magnitude and apparent magnitude, as follows:

> the table we see seems to diminish as we remove further from it; that is, its apparent magnitude is diminished; but the real table suffers no alteration - to wit, in its real magnitude; therefore, it is not the real table we see. I admit both the premises in this syllogism, but I deny the conclusion. The syllogism has what the logicians call two middle terms: apparent magnitude ... in the first premise; real magnitude in the second (1895, p.304).

Reid does not however get to the logical bottom of arguments of the perceptual relativity sort, which lies in identity.

On a common modern variation on Hume's argument two observers A and B in different positions have different sense impressions of the table, for example, they see it as different in size according as their distance from it varies; but the real table cannot have two different sizes. It is, therefore, not the real table, but something else (e.g. sense data of the table) that they see.

The main logical assumptions of the argument are not supplied, but when they are, its closeness to the basic incompleteness argument is clear. For the argument is essentially that the opaque or perceived object (e.g. the perceived table) has different properties from the real table. Therefore, by Leibnitz, the perceived table cannot be identical with the real table, and so must be something else, e.g. Hume's images. As before, it is concluded that what is seen is not the real table i.e. that realism is false. Hume's use of the fact of apparent variation of the size of the table (i.e. variation of size of the perceived table), and the second argument's use of the difference in perceived size to different observers, are designed to establish that the properties of the perceived table cannot be the same as those of the real table.

Thus the style of argument is very similar to that of the incompleteness argument. And it is resolved in the same way, by rejecting the full strength Leibnitz principle which creates the problem of how the perceived item and the real item can be identical. This sceptical argument, like nearly all the others, is the result of an inadequate treatment of intensionality and inexistence, and of the application of principles, such as Leibnitz identity, derived from the Reference Theory.

Arguments of similar style are commonly deployed also to (try to) show that perception must be analysed into two components, (raw) data or experience and, superimposed on that, interpretation. Such arguments (further considered in 11.4ff.), which lead to intermediary objects, those of experience, likewise result from the mistaken quest for fully Leibnitzian objects in perception.

A common route to intermediary objects is from *nonveridical perception*. Grave sets out succinctly the usual philosophical leap, specialised to the case of memory:

> We have false memories and these have no intrinsic marks to distinguish them from true memories. While the object of a true memory could perhaps be a past event as it actually was, the object of a false memory could not be a past event as it actually was. The false object must be an idea (60, p.24).

Why must it? The false object is simply an object - in this case an event that did not exist, at least as remembered (it soon turns out). To authorise the philosopher's leap to ideas one of the two great prejudices underlying the Theory of Ideas has to be imported, namely that ideal substitutes have to be found for nonexistent objects. Without this assumption, which serves to enforce the Ontological Assumption, the argument fails to establish its conclusion (the argument is further considered and criticised in detail in 12.1).

Another popular argument for intermediary objects which poses no problem for noneism is the *time gap* argument. The usual gap argument is premissed on the assumption that what is directly perceived is always in the present, an assumption the argument can be turned around to repudiate. More generally, it can be convincingly argued that a perceiver can sometimes perceive what no longer exists from the adjacent past, something that on noneist principles is quite unproblematic. A nice example provided by Meinong (discussed in Russell 04, p.213) is the perception of a complete melody; since some of the notes in the perceived melody are in the past and no longer exist, in perceiving the melody one perceives what in part does not exist. Another example of perceiving what does not exist in the adjacent past is of this sort:- The stew was on the table some time ago. The stew no longer exists: we have eaten all of it.

Busho, one of our neighbours, a large bush-rat (*Rattus fuscipes*) who has superb sensory equipment for smelling, enters. Busho smells the stew. He looks about to see if any of it remains, e.g. that we have dropped on the table. The truth *Busho smells the stew*, states a perceptual relation between an object that exists and one that does not exist, though it did exist in the vicinity. One might try to say that, even though *we* can't detect it, *the smell of the stew* exists - if one is prepared to allow that smells exist separately from their sources, just as one can say that perceptual traces of stars exists after they have disintegrated - but that is not really to the point. For Busho smells, *not* just the smell of the stew, but the stew.

Arguments against direct realism and for intermediaries from *sensory hallucination and sensory illusion* are likewise met at once by noneism. Consider hallucinations, where items that do not exist are perceived (there need be no sense deception). There is simply no problem, and no call for substitute entities which are referentially related to perceivers. One simply sees what does not exist. Sensory illusion is even less likely to deliver the intermediaries representationalisms and phenomenalisms seek and require, since in illusory cases entities are perceived. They are simply not as they appear to be; the stick which is seen exists but it is not bent, the way it looks to be. Certainly illusion and the like reveal that sense perception is occasionally in error; but direct realism is not committed to the (false) thesis that philosophers try to hang on "naive realism", that perception is totally reliable, that things are always as they are perceived to be (cf. Hospers 56, p.380).

Nonveridical perception does however cause serious difficulties for rival positions to noneism which account themselves direct realist, for example for Armstrong's theory of perception (in 61, 68) where nonveridical perception - which is said not to be perception at all - has to be analysed away, but the analysis given remains unsatisfactory. Interestingly, but by now not too surprisingly, Armstrong's argument that such an analysis is required (why try for one if it is unnecessary?) is anti-noneist. Armstrong's route to his account of nonveridical "perception" of sensory illusion (61, p.81 ff.), proceeds by explicitly rejecting principles of Meinong's theory of objects and thereby assumptions of common sense. Armstrong assumes that there cannot be relations of perception or belief to propositions that are false or states-of-affairs these propositions delineate: for example, no relation can obtain between creature a and the inhabited centre of the earth in virtue of a's (false) belief that the centre of the earth is inhabited, because it is false that the centre of the earth is inhabited and so the state of affairs of its being inhabited does not obtain. Armstrong's reason is that corollary of the Ontological Assumption that there cannot be relations to what does not exist[1], the argument being that there is nothing to relate to. Nothing existent, certainly; but objects to relate to, also certainly. For a's belief that the centre of the earth is inhabited relates a to a proposition, and this relation induces a (definable) relation between a and the inhabited centre of the earth. Similarly perception remains a relation, whether or not what the perceiver relates to is true or not true, exists or does not exist. Intensional relations commonly and quite characteristically relate the existent and the nonexistent.

According to Armstrong the commonsense account of a visual hallucination of a cat on a mat, as the 'seeing' of an object which does not exist, though 'very natural', is 'completely mistaken' (61, p.83). But he does nothing to show this; he simply reiterates his own opposing views, that 'there is no object at all, physical or non-physical, which we are perceiving in any possible sense of the word "perceiving"' (p.83) - a completely indefensible claim since such senses could easily be invented were they not already familiar from natural language (e.g. a sense could be defined in terms of Armstrong's own belief relation, so that, for instance, a perceives^A x iff a has the false belief that he veridically perceives x). The "error" in introducing such a (natural language) sense of perceiving, in which one can perceive what does not exist, is said to be 'ultimately ... the same as Meinong's error about the objects of thought and belief' (p.84), and that Armstrong supposes is the end of the matter. Of course it is not: positions can no longer be dismissed by being associated with Meinong. Meinong made no errors in his main theses concerning objects of thought and belief.

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[1] If there were relations to nonexistents, then nonentities would have properties, contradicting the Ontological Assumption.

In Armstrong 68 where the theory is elaborated (and amended) a somewhat different route is taken to the thesis that perception is the acquiring of beliefs (or information), or rather that perception is the acquiring of false beliefs or inclinations to false beliefs (p.112). But the thesis maintains its status as a (dubious) conjecture, since the argument given (68, p.209) is inconclusive for the following reason:- even if a 'biological function of perception is to give the organism information about the current state of its own body and its environment' this does not 'lead to the view that perception is nothing but the acquiring of true or false beliefs concerning the current state of the organism's body and environment' (p.209, my emphasis).

Not only is the route defective, so are the results reached (summarised 61, p.192). For in the ordinary senses of 'belief' and 'inclination to belief', perception cannot be adequately explained in terms of acquisition of beliefs and inclinations thereto; yet a specially prepared sense of 'belief' which did the job would be without much explanatory merit.[1] On Armstrong's account however, perception does disappear, in a most unlikely way, into the acquiring of beliefs, true beliefs in veridical cases, and false beliefs otherwise. Such an account - which would in any case only supply a necessary condition, since such beliefs can be acquired, even immediately, in other ways than by perception, certainly on nonempiricist theories[2] - is patently inadequate, in both true and false cases, since such beliefs are unnecessary. Apposite also in perception cases is Reid's reply to Stewart's view that conception and imagination always carry temporary belief with them -

> I can conceive the steeple of the cathedral standing on its point ... I cannot find a vestige of belief accompanying it (quoted in Grave 60, p.32).

To avoid counterexamples to his account, Armstrong, as a first theory-saving strategy, tacks "inclinations to beliefs" on to beliefs.

> The inclination to believe is a thought about the world that would necessarily be a belief, but for the fact that it is inhibited by previously acquired knowledge which holds the thought in check.

Unless empiricism is written in at the bottom, in the assumption that all immediately acquired beliefs or inclinations to beliefs are cases of perception, the disjoined condition beliefs or inclinations to beliefs is not sufficient. Certainly on Meinong's theory one can immediately acquire inclinations to believe in other ways, e.g. through characterisation principles. Nor, more importantly, is the disjoined condition necessary. For consider certain sorts of drug-induced hallucinations: perception occurs but neither false beliefs nor inclinations to false beliefs are acquired, because, for example, there is no inclination to accept what is seen as real, or perhaps as other than a passing show. Consider likewise Smythies' example of hallucinatory flowers (presented above).

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[1] Though this is what Armstrong would eventually resort to with 'counterfactual beliefs' and 'potential beliefs'.

[2] It might be thought that the account could be repaired, as a sufficient condition, by adding (after 'acquiring') 'by (means of) the senses'. But Armstrong disallows - and really has to disallow, since it involves a

(Footnote 2 continued on next page)

The serious problems in trying to dismiss nonveridical perception as not really perception of objects (nonentities), but as something to be recast in terms of sets of beliefs and inclinations to beliefs and their acquisition, can be brought out as follows:- You can compare what you see in your vision (or your dream) to a painting, e.g. the interiors resemble those of a Vermeer, you can compare the shining city of your vision to a Breughel, or perhaps to a city in a poem by Blake. But how can you compare a set of beliefs or inclinations to a painting? A Vermeer interior is not a set of beliefs, nor can it be compared to a set of beliefs. It seems that a category mistake is involved in taking such occurrences as involving belief sets. One may be presented in a vision however with something of the same order as a painting, and just as with observing a painting one might simply take note of it without forming any particular beliefs about its status in the actual world. For example, one might see an after-image without having or acquiring any particular beliefs (or inclinations to believe) about whether or not it exists.

Eventually Armstrong concedes that there are cases of perception without belief and without inclination to believe (e.g. 68, p.222: one case allowed is that of perceptions involved in looking in a mirror). His further theory-saving strategies there is no inclination to believe: they involve yet further disjuncts. The first step yields, in effect, the disjunct: Beliefs or inclinations to belief or counterfactual beliefs or potential beliefs. But a "counterfactual belief", 'but for ... he would have believed', is not a belief, except under an unacceptably low redefinition of 'belief'; similarly in the case of "potential beliefs". Such "beliefs" cannot (contrary to 68, p.223) be 'fitted into' Armstrong's analysis without abandoning it. Nor is Armstrong entirely satisfied; he proceeds to add, as a second step, a further disjunct: or something 'like the acquiring of beliefs or potential beliefs' (p.223). This removes almost all the stuffing from the original thesis (to which Armstrong shortly reverts, without any appearance of dis-ease, although it has been qualified away).

Even if the account worked it would only cater for perceives that. Armstrong supposes (in 61) that 'a perceives b' can be reduced to something of the form 'a perceives that bf'; but it is very doubtful that it can be. Certainly the favourite substitute for predicate 'f', which cannot be left free, namely 'exists' fails badly; consider, for instance, 'Smythies perceives an hallucinatory rose'. Armstrong's subsequent 'account of talk of perceiving things' (in 68, p.228) should be, it seems, that 'a perceives b' is tantamount to 'for some f, a perceives that bf': 'the idiom "A perceives x" ... tells us that it is information or misinformation about x that is acquired but it tells us nothing more' (p.228). The quantificational analysis is not however equivalent to Armstrong's proposal, for whereas A's acquiring of [mis]information about x does not imply that A perceives x, A's

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merely contingently connected and circularly characterised restriction - this addition as part of his analysis (68, pp.211-3).

It is rather noticeable that although Armstrong devotes a good deal of space (especially in 68) to defending one half of his conjectural analysis under the heading 'perception without belief' he devotes no space to defending the other half, "requisite" beliefs without perception.

perceiving xf does imply that A perceived x.[1] The more questionable converse depends on the assumption that A cannot perceive x without perceiving something about x. But if such an assumption is true it is at best contingently true, and so will not provide a logical connection of sufficient strength for an analysis. And it is doubtful that it is even contingently true. Consider, for instance, the child who perceives something, just something, without perceiving anything about it.

A noneist account of perceiving things[2] likewise diverges from Armstrong's account (in 68) on other central points. Firstly, it is false that 'phrases of the form "perceives an x" have an "existence grammar"' (p.227); a perceiver may perceive what does not exist. Secondly, as a consequence, it is false that when A perceives x 'it is entailed that x is the cause of A's perception' (p.229); for suppose x does not exist.

Armstrong claims as a virtue of his theory that it 'can very simply solve pressing problems about our conception of the physical world' (p.239). It is very doubtful that the theory does succeed in that. For example, in Armstrong's solution to the "problem" of mirror images, there are no objects such as mirror images, just acquiring of false beliefs of certain sorts, etc. But this destroys the logic of mirror images where such items function as objects of quantification. Thus both you and I can see the image of a bucket, so some one object is seen by both of us; etc. In contrast, noneism lets us retain the cherished picture of the physical world according to which

> the physical world ... consists of a single realm of material objects and perhaps other objects, related in space and enduring and changing in time. Material objects have shape and size, they move or are at rest, they are hot or cold, hard or soft, rough or smooth, heavy or light, they are coloured, they may have a taste, and they may emit sounds or smells ... (pp.239-240).

The sorts of things that are supposed to upset this picture, cases of nonveridical perception, and perceptual relativism, examples such as mirror images and white dots, have already, for the most part, been considered.[1] They do not upset the noneist picture. That is, 'it is possible to preserve our picture of the physical world more or less intact' (p.241), not in the difficulty-fraught ways of the representative theory of perception or of Armstrong's analysis, but by distinguishing in the noneist way between two classes of perceived objects, the existent objects of the physical world and the nonexistent objects of appearance.

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[1] The principle does not hold for absolutely every subject however: consider, e.g., 'a sees that it will rain' or 'a perceives it is snowing'. What is more Armstrong looks like tearing down his own account, for (p.230) he rejects the thesis that A perceives x is y entails that A perceives x on the basis of the following example: that when A sees smoke emerging out of a chimney, A can be said to see that there is a fire in the hearth, but cannot be said to see the fire. With the relation of perceiving, especially literally perceiving, the example breaks down. However it is true that there is a determinate of 'see' (and perhaps also of 'perceives') which permits inference: equally there is another important determinate, clear for 'perceives', for which the example fails.

[2] Perception relates perceivers not only to (bottom-order) things and to (higher-order) judgements, but also to other higher-order objects, e.g. featurestances, as in 'a perceived the ugliness of the city', and properties, as in 'a sometimes perceives pure redness'. Nor do these further cases simply reduce without remainder to the first cases, as 12.3 will reveal. However all cases are of the uniform form xPy where x is a perceiver and y an object.

It remains to argue more generally the adequacy of the noneist version of direct realism as against rival theories of perception. Rivals to noneism typically offer accounts of intensionality and inexistence which lead, in the illustrative case of perception, to phenomenalist or sense data theories or indirect or representational theories. Noneism enables us to say the obvious thing about perception, namely that what are observed are commonly external things, just as it enables us to say the obvious thing about nonentities, namely that they are sometimes objects of true statements: rivals do not. To establish the large claim staked out it helps to separate the following necessary conditions for a logical treatment of intensionality to be able to provide a satisfactory treatment of direct realism, keeping in view the working illustration, that of the theory of perception:

(i) The relational, or realist, condition: Intensional statements must be able to provide genuine relations. In order for intensional statements to provide genuine relations, what has to be admitted is the treatment of the intensionally indicated object as a full subject, and so, for example, quantification into intensional contexts.

(ii) The directness, or no replacement, condition. The relation applies to the intensionally indicated subject and not to some analysandum inserted to analyse it away. The apparent subject of intensionality is normally the real or genuine subject, not some replacement subject. Just as according to the noneist when I say I am thinking about Pegasus what I am thinking about is Pegasus and not a concept, a name, or a nothing-entity (e.g. the null set or a null entity), or some other allegedly existing item (e.g. everything that exists that isn't Pegasus), so in the parallel theory of perception case what you see is the table and not an indirect mediating object dropped in to do the same jobs as the substitute referents in the case of nonentities. That is, the obvious objects of perception are normally the genuine ones.

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[1] White dots are the main exception. The problem, explained by Austin (in 62), is that (in a suitable context) it is true that

i) That white dot is my house, and
ii) I live in my house,

but it is false, what follows by legitimate substitution of an extensional identity in an extensional frame,

iii) I live in that white dot.

The trouble lies with i) which is contextually compressed, as can be independently seen. For it is just false that my house is (identical with) a white dot. The trouble is removed upon expanding i); for it amounts in context to

i*) What looks like [appears to be] a white dot at this distance is my house.

Then the substitution in ii) is unproblematic, for it leads only to

iii*) I live in what looks like a white dot at this distance.

Not just any relation, then, will provide a direct realist theory; it must be a relation between the right sort of things. In order to satisfy the second condition for a direct realist theory intensional predicates must be able to apply directly to the intensionally indicated objects which may be in the actual world. That is, intensional properties must be able to be properties of items in the actual world which also have other nonintensional properties: for example, in "The oasis is lush and green and Bookchin is looking at it", the properties must be attributable to the one item, the oasis, which has both extensional and intensional features.

One and the same item, which may or may not exist, has both extensional and intensional properties. This is brought out by the conjunction test for condition (ii), by examples of conjoined statements which contrast two such properties of the same item. Recall the logical features of such examples as 'the girl was crossing the road but the driver saw her too late', the two contrasting properties of the one item, the girl. A real realist theory will similarly have both extensional and intensional properties as properties of the one item. Being able to do this is basic to the noneist theory being developed.

Noneism can meet these very reasonable conditions on a realist theory of perception. And it does more than just enable a direct realist position to be adopted: it also blocks familiar routes to indirect positions and, what is closely related, to scepticism; it closes these argument routes on grounds of invalidity (as has been noticed). For example, one argument for indirect objects of perception that leads on to scepticism is by way of nonveridical perception. Consider 'he is looking at a beehive' or 'he seems to see a beehive' where no beehive exists. Then there must be, so the argument goes, a mediating entity, e.g. a sensation as of a beehive, which is what the observer really sees, or more accurately has, which is distinct from the beehive itself but somehow related to it. But on a noneist account no such mediating entity is required: what is looked at is a beehive which does not exist.[1]

More generally, what are perceived in cases of nonveridical perception are either objects which do not exist at all (hallucination cases) or objects which though they exist in fact have properties different from those they are perceived to have (including illusion cases, e.g. the stick exists but is not bent). In both sorts of cases the objects of perception themselves (e.g. the bent stick) do not exist. This five-year-old-standard explanation shortcircuits several sceptical arguments: there is no initial step back to alternative objects of perception (such as sense data clusters), similar in some respects to existent objects, whose correlation with actual objects can readily be put in doubt. Nor does analysis demand a step back to real intermediary objects of perception.[2]

The noneist account is thus only one step removed from a "naive realism", and indeed is a version of what the American New Realists counted as naive realism:

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[1] The differences between seeing and seeming to see do not disappear. They can in fact be explained, for what it is worth, in almost exactly the way Austin explains them (in 62).

[2] Nothing of course stops the introduction of intensional objects of perception, sense data, and so on; and some of these objects are readily defined. It is simply that such objects have no real work to do, they are theoretically superfluous; and they get in the way, and in the resulting confusion aid sceptical causes.

> The objectified dreamland of the child and the ghostland of the savage are the first effort of natural realism to cope with the problem of error (in Chisholm 60, p.153).

Simply add to methods of the child and the savage the nonexistent objects of the noneist, which include the worlds of intensional semantics, i.e. ghosts and dreamworlds rendered logically tractable. This natural - or commonsense - realism is not naive, in the sense that it takes all perception as veridical (in this sense it is doubtful of course that the naive realist is more than a fabrication of philosophers: a mythological stalking figure who helps get courses in epistemology started). But it does take all perception as directly presenting objects to perceivers, only not all of these objects will exist and not all of them will actually be as they appear to be. The New Realists, in their criticism of natural realism, assume however that the perceived objects must all exist in the way presented (they assume in fact what is the basic trouble with all the standard theories of perception, namely the Reference Theory: that perception discourse, like other discourse, must be, at bottom, referential). Remove their assumption - as Reid removed the assumptions of the Theory of Ideas, an outcome of the Reference Theory - and the objections they make collapse. Consider, for example, the difficulties they try to manufacture out of the issue: where do 'the objects of our dreams and our fancies, and of illusions generally' exist? But if they do not exist,[1] then they do not exist somewhere. There is no point in trying to find some place, such as the observer's mind (a curious place, which soon causes new difficulties) in which to locate them: indeed this is to make the mistake of treating the objects as referential.

To return to the conditions for direct realism: only a noneist theory can meet the conditions imposed in a satisfactory fashion; theories set within a referential or classical logical framework cannot. Observe that the argument which follows will work, within limits, with either facet of nonreferentiality. It is, for instance, enough to rely on the opacity of perception to show that a purely classical theory cannot succeed. But the other facet is important in showing, for example, that no analysis within the framework of Montague semantics can succeed.

ad (i) i.e. Relationality. The analysis of intensionality which noneist theory makes possible allows for intensional predicates to yield genuine intensional properties of the intensionally-indicated object which is also treated as a full logical subject. Thus a noneist theory allows statements such as $a\phi b$, where ϕ is intensional, to yield a genuine relation. Although a noneist theory can satisfy condition (i), rival theories which do not admit replacement within and quantification into intensional contexts cannot. The prohibition on quantifying-in blocks the analysis of intensional predicates such as those of observation as genuinely relational. For a genuine relation has converses which show internal subjects, allow replacement and particularisation, and so on. On any such "analysis" which refuses these logical transformations, observation cannot give an entire relation between an observer and an object observed: all it yields is, e.g., a property of an observer. The numerous hints of a sense datum theory lurking in the murky shallows of Quinean utterance are not then a merely accidental phenomenon: some such indirect epistemological position is indeed an outcome of the currently popular position prohibiting quantifying-in - although the fact that it is is evidently not realised by most of those who accept such a position, who appear to believe that they have the option of adopting a direct realist theory of perception still open to them.[1] There are even some who want, inconsistently, to run such logical theories in tandem with a direct realist theory of perception. There has been little attempt made to put together logical and epistemological theories in recent times. In particular, insufficient thought has been given to the currently canonised classical logical doctrine and its implications. Either epistemology is a much more cut and dried matter than most philosophers have thought and epistemological positions such as those of sense data must be accepted like their logical counterparts as established theories, or the correctness of the logical counterparts is much less settled than it is usually taken to be. The sense datum theory will have to be elevated from its recent humble position to one more nearly equal to that of its powerful and well thought of relative, i.e. classical logical theory, or (preferably) the powerful relative should be demoted to a similarly humble position.

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[1] As the New Realists at one point recognise, either contradicting their theme that they must exist or, what comes to the same, counting the objects as nonexistent existents.

On the no-analysis, no-quantification-in theory, for example, we are (to elaborate on previous points) prevented from treating claims such as 'The table was there and it was noticed by Charlie' in the direct way, from taking both the location of the table and Charlie's not noticing it as properties of the table: properties like being noticed or perceived by observers cannot, it is alleged, be properties of tables in a direct and obvious way (they are not traits of a table). Accordingly the theory prevents us from saying the obvious things about tables etc., that what are perceived, observed and so on are objects in the actual world - just as it prevents us saying the obvious things about objects that do not exist, namely that we can make statements truly and directly about what does not exist.

Adopting this position on intensionality, that of unanalysability with a view to dispensing with a logical analysis which takes account of nonentities, thus involves a heavy penalty with respect to the actual world. For, as a result intensional statements can never yield properties of items in the actual world or relations of them to observers. The intensional floats, disconnected from the actual world. The no-analysis theory leads us to see the object as a sort of content, or data-cluster, having no genuine connection with anything in the actual world; and these data as divorced from actual objects. The theory accordingly yields unanalysable perception contents.

In view of the blocking of analysis of the relation of intensional relations of observers to objects, what we wind up with, all we are allowed, are properties of observers. It becomes then a problem how observers relate - extensionally it is supposed - to the world. This is the genesis of several sceptical arguments: for relations cannot be manufactured out of properties. The result is of course observer oriented: hence too the familiar array of anthropocentric theories of perception, such as idealism, phenomenalism, etc. The key part of the solution to the problem is elementary: the relations that connect objects in the world and observers are intensional ones. It is perfectly legitimate to abstract a subject from mixed claims and obtain, e.g., 'the table was both there and observed by Charlie to be there', with both features applying to the table. Making this sort of extraction of subjects is both a legitimate, and an indispensible move, and can be readily handled logically within the theory of items.

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[1] Put differently, a good many people attracted to logical theories like Quine's haven't realised what the bill of goods includes, and also, if they had, might come to look at it a little more critically, since to many philosophers realistic theories of perception are appealing.

ad (ii), i.e. Directness. A noneist theory can meet condition (ii) in full. First of all, it can meet the conjunction requirement, because just as Pegasus is a winged horse and has the property of being thought about by Charlie, so the girl can both be crossing the road and have the property of being seen or of not being noticed by the driver, i.e. intensional properties apply to the same objects as extensional properties. There are no special intensional objects required. On the noneist theory such statements are about the obvious subject, about what they seem to be about. By contrast the directness condition rules out all indirect and translational analyses of intensionality, that is, all those theories which, though they allow quantifying into intensional contexts and allow that intensional predicates can yield genuine relations, insist upon translating perception statements into something else, upon providing a substitute subject (for example, concepts or names, as in theories such as Frege's) which can then be regarded as occurring referentially and as denoting what these statements are really about.[1]

Furthermore only a noneist theory is going to be able to give a straightforward account of perception, which yields intensional properties directly as properties of items - because it is evident, firstly, that the objects of intensional attitudes need not exist and, secondly, that intensional relations are generally not transparent. Since there is no basis for imposing one analysis for entities and another for nonexistent items in intensional settings when in fact there is no relevant difference between cases (e.g. it makes no difference to the analysis whether x exists or not in 'John imagined x in his bedroom'), any satisfactory analysis will have to work in the same way for both entities and nonentities. Hence a theory that refuses analysis in the nonexistence case should likewise refuse analysis where entities are concerned; and only a theory which allows direct analysis in the nonentity case (that is direct extraction of a subject to which the property is ascribed, e.g. by passive transformation) can properly allow the direct ascription of an intensional property to an entity. It simply does not matter whether the object exists or not - sometimes it would not be known - for the logical analysis involved. Thus the insisted-upon distinction between the existent and nonexistent is not logically relevant in many cases, e.g. many intensional cases, and should be immaterial to the analysis obtained. However a suspicion of the nonexistent has broadened into a suspicion of the intensional, and a drastic narrowing down of the epistemological options and a Parmenidean rejection by philosophers of much of what actually goes on, e.g. John's noticing the table but thinking it was a desk.

The options for the treatment of intensionality that the referential theories (of existence and identity) currently in vogue force upon us are very limited. Each one of these options is independently unsatisfactory because of its treatment of both nonexistence and opacity and is thereby associated with unsatisfactory theories of perception.[1] These options exhaust the positions which a referential logical theory allows, and not one of these makes a direct realist theory possible, for each leads to violations of at least one of requirements (i) and (ii). The options on intensionality the referential theory admits can be summed up in a biological classification of referential positions on intensionality, as follows:

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[1] Similarly, it rules out, as we have seen, Armstrong's theory of perception, which depends upon some sort of analysis at least in the case of nonveridical perception.

(a) treat them as referential as they stand or,

(a*) do not;

- (b) analyse them into referential form by transforming the subject to a referential one or,

- (b*) do not, i.e. refuse analysis.

The options are exhaustive.

We consider each option in turn in the perception case.

(a) This is the naive (Russellian) theory according to which the difference between extensional and intensional is not given recognition in the treatment of subjects and predicates. There is no prohibition on quantifying into intensional contexts but such quantification assumes referential transparency (or extensionality) and existential loading, i.e. features appropriate only for (purely) referential contexts. For example, 'I am thinking that some horse, Pegasus, is a winged horse', is considered as 'I am thinking that there exists an x such that x is Pegasus and x is a winged horse', i.e. 'I am thinking that Pegasus exists and is a winged horse'. As the example illustrates, this method commonly gives the wrong truth value and where it does not do so this is often a matter of sheer luck.

In the case of perception, the position reduces to the naive realist theory of perception, with its failure to recognise that predicates like 'observes' and 'listens to' are different from 'kicks'. The problems of naive realism arise from this, from its attempt to fit the nonreferential into a referential frame, for example, from its attempt to treat the intensional properties of items as if they were simple extensional ones and from its attempt to treat all perception as veridical. Most of the objections to naive realist theories are ways of pointing to the intensional, nonreferential, nature of perception; and a commonsense, as opposed to a mythical naive, realism is one that takes account of the intensional character of perception.

(b) The translation moves recognise the deficiencies of naive realism and attempt to provide substitute subjects (in the corresponding case of universals these are concepts or names according as to whether the position is a conceptualism or a nominalism). They proceed by attempting to isolate the intensional component into these substitute subjects, and then by treating the resulting new relation as an extensional one.[1] They may require translation or replacement, or they may demand analyses or replacement only in problematic cases, partial replacement. Among the latter are double or multiple reference theories of the Fregean type as analyses of intensionality. The counterparts in epistemology of replacement positions are all the mediation theories, e.g. representative realism and some forms of phenomenalism.[2] These theories attempt to isolate intensionality in some ideas or sensations, to which the observer is related by a straightforward extensional relation. It is again a way of avoiding coming to grips with the phenomenon of intensionality and the fact that it is different from extensionality and demands a rather different sort of treatment.

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[1] Here again we see the chain: A certain type of treatment of referentiality compels a certain sort of treatment of intensionality, which compels a certain sort of theory of perception.

(b*) These are positions which effectively prohibit analysis, which reject subject extraction and quantification into intensional contexts. (This corresponds to the nominalism of, for example, virtual set theory). These lead to the (adverbial) treatment of intensional statements as yielding purely properties of the holders of intensional attributes; genuine relations disappear. In the epistemological case observation relations become properties of the observer. The sense datum theory of familiar phenomenalism fits in here for example. Observe that phenomenalism, like nominalism, splits into (b) and (b*) forms.

As in the universals case, so in the epistemological case, all the positions overlook a basic option. In the universals case the option is that of talking about universals without attributing existence to them; in the epistemological case the option is that of taking intensional inexistential relations as genuine, direct, and not in need of extensional, or referential, reduction. As with universals, so with epistemology, application of the Reference Theory and its elaborations generate many problems and a range of unacceptable "solutions". The overlooked alternative in epistemology, as with universals, is not to try to treat nonreferential occurrence as if it were referential, as if intensionality did not occur, but to try to explain, accommodate, and systematise the theory, and face up to such occurrences beginning with the recognition that 'thinks' and 'sees' are different from 'kicks', but no less respectable. As in the case of nonentities, the whole demand to give an explanation in terms that the empiricist or idealist allows as satisfactory, to remove the alleged mystery by doing so or giving a reduction in the accepted framework, should be resisted. The correct nonreduction recipe is: don't try to explain intensionality and nonexistence away, try to explain them. This is what the theory of items is largely about.

§11. *Other illustrations: value theory, the philosophy of law, the philosophy of mind, ...* The treatment of the apparently diverse problem of perception and of universals are but two illustrations, in (what are usually accounted) epistemology and metaphysics respectively, as to how noneism can bring out the obvious and commonsense account of matters which have become, under the influence of the Reference Theory, deep philosophical problems. A similar procedure to that of the illustrations may be applied in other philosophical areas, e.g. in the philosophies of mathematics and science (as in chapter 10 and 11 below). Some other areas where noneist treatment can be fruitfully applied are worth recording.

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[1] A similar strategy can be used, likewise with some success, in providing extensional semantics for intensional logics, where the intensionality is pushed back into (unanalysed) worlds and their interrelations: see 1.24 and for criticism 10.3 ff. and ER.

[2] There are of course many mediation theories, in particular phenomenalist theories with existing intermediaries beyond which, so it turns out, there is nothing, and representative and Kantian theories according to which beyond the transparent immediates there are things.

Area 1. Axiology and the objects of value. Valuational relations are inexistential. That is, valuation relations are genuine relations which may truly relate a valuer to an object that does not exist; thus, e.g. in 'a valued b', 'a praised b', 'a blamed b', 'a preferred b to c', 'a ranked b as better than c', b and c may well not exist. Just one live example will suffice: consider 'Sensitive environmentalists prefer a no-logging future for the fragile forests of the Amazon to a selective-logging future'. Neither future can be expected to eventuate: the objects spoken about do not exist. But once again quantification and other logical operations are not thereby ruled out.

Important valuational relations are intensional. This is most simply shown using the observation that ranking relations such as preference may relate states-of-affairs or, with a little stretching, propositions, e.g. 'a preferred our doing x to our doing y' and 'a preferred that p to the proposition that q'; and then making the further observation that material equivalents, or for that matter strict equivalents, cannot be intersubstituted generally preserving truth. Similarly central relations in aesthetics, such as admiration are inexistential and intensional.

Largely because of assumptions drawn from the Reference Theory, the relations (and properties) of value theory have either been misconstrued, as existentially-loaded or as extensional - yielding in combination absolutely naive naturalism - or else the relations, because of their intensional inexistential character, have been, if not differently misconstrued (e.g. as not genuine relations, or as blocking logical analysis within the scope of the relation), taken as problematic and in need of reductive analysis. The result has been an array of positions in ethics and aesthetics parallelling those considered in perception theory. An example should serve to recall some of the familiar philosophical ploys - value data is past redemption (nihilism, in the form of scepticism about values); problematic value data is nothing over and above its unproblematic bases, personal taste, preference, feelings, emotions (subjectivisms and forms of emotivism, corresponding to phenomenalism in perception theory); the problematic data reduces to other unproblematic bases (imperativalism, utilitarianism, naturalisms, corresponding to representationalism). As we have seen, logical analysis within intensional functors is perfectly intelligible and legitimate. But as in epistemology, the familiar prohibition of analysis inside intensional functors, induced by referential assumptions, blocks relations of valuers to things valued. Everything becomes just not-further-analysable properties of valuers. It is a short step to the view that values are subjective: it is all a question of features of valuers, a subjective matter for individual valuers.

The familiar objection will be: if valuational attributes are genuine irreducible attributes - or at least attributes not reducible along any of the tried, and as you say failed, lines - then surely you are stuck with an indefensible objectivism, very likely with some sort of intuitionism. The reply, also hopefully becoming familiar, is: No, not at all. Intuitionism is like platonism in theories of universals; it supposes values to exist, and it too commonly supposes valuational properties to behave like extensional properties (but Moore 03 did not suppose the latter, as his contrast and comparison between goodness and yellowness indicates). The dichotomy between objective and subjective, commonly used as a weapon against environmental value theories, is accordingly a false dichotomy. As it was in universals theory that all the standard positions turned out to be referentially based and were avoided by noneism, so it is in value theory also. Certainly value attributes are irreducibly intensional and may apply to objects and values that do not exist; but it does not follow that no account can given of them, or that they are detached from valuers and to be found in the world, or that they are only comprehended or apprehended by a special sense or intuition, and have no connection with individual and group preference rankings. An account can be given - it relies on a semantical analysis, not a translation or reduction - which makes the connection with valuers, with their preference rankings, and which therefore can be used to resolve the epistemic problems of intuitionism (details of such an account are given in ENP).

Area 2. Objects of social and political theory. Many of the fundamental notions of social and political theory are likewise intensional and inexistential. Consider, for instance, consent. It is opaque, and intensional in the second place. x may consent to ϕ with y, but not consent to ϕ with z, though z = y, e.g. z is Henry Higgins and y is the man known as 'Professor Higgins' who has a communicable disease. Sometimes this opacity has been glimpsed but expressed somewhat misleadingly in terms of consent depending on the description of what is consented to. Consent is also inexistential; e.g. I can consent to meet you at a place that does not in fact exist; you can consent to purchase goods that do not exist, etc. Yet most of the theories of consent that have been proposed ignore one or both of these fundamental logical features of the notion.

Other examples concern obligations, rights (see ENP), promises, and (as the next area will reveal) contracts.

Area 3. The philosophy of law. According to Honoré, who provides a useful introduction to this area

> where lawyers have yielded to the temptation [to assume the Ontological Assumption, to insisting that we cannot talk about or operate with what does not exist], pernicious doctrines have resulted (71, p.302).

Honoré's working example, from the law of contracts, is

> the legal doctrine that we cannot sell nonexistent goods. This doctrine is found in Roman, modern European, English and American law. Great efforts have been made to find ways of overcoming what are felt to be its manifest inconveniences. Thus, if the sale of non-existent goods is void, not merely can the buyer not be compelled to pay, but the seller cannot be sued for failing to deliver the goods. Hence if the buyer has made a good bargain, he loses the benefit of it. Clearly this is unjust (p.302).

Similarly, if the buyer incurs heavy expenses in equipping to salvage the goods, as in McRae v. Commonwealth Disposals Commission, it is unjust if he has no redress for damages under the contract because it is void.

The real reason for this pernicious legal doctrine is, so Honoré argues, a logical one, the Ontological Assumption in legal form: 'the agreement can be nothing but a phantom since there is nothing on which it can fasten' (Cheshire and Fifoot, The Law of Contract, 6th edition, p.192; quoted by Honoré, p.303). Similarly in the 'leading case' of Couturier v. Hastie, the judges

> intimated that the contract would be void, inasmuch as 'it plainly imports that there was something which was to be sold at the time of the contract, and something to be purchased', whereas the object of the sale ceased to exist (Anson 75, p.277).

Likewise in Dell v. Lever Bros., Lord Atkin stated:

> though the parties were in fact agreed about the subject matter, yet a consent to transfer or take delivery of something not existent is deemed useless, the consent is nullified (32, A.C. 161, p.223).

Correspondingly, the 'solution to the legal difficulties concerning the sales of non-existent goods' lies in rejection of the legal Ontological Assumption, that contracts concerning nonexistent objects cannot be valid and binding, that we cannot buy or sell nonexistent goods. Thus Honoré (p.305):

> To the extent that it is possible, not merely to refer to, but to say true or false things about nonexistent objects, the court should be entitled to treat the sale of a non-existent object as valid,

and rather similarly Slade (54, p.385) who on the same basis criticises the doctrine of mistake under which the sale of nonexistent objects is commonly treated (e.g. in Anson 75). Slade's argument is rejected in Anson, where - in contrast to the Russellian position of the judges in Couturier v. Hastie and the British Sale of Goods Act 1893, that a contract concerning what does not exist is not valid, but void - a Strawsonian position is attempted, that the question of validity of such contracts does not generally arise (pp.277-78). Since this position, like the Russellian position, runs into serious trouble with McRae's Case, where the question of validity was crucial in the action for damages, Anson's approach, like Strawson's, is duly complicated and rendered more opaque. According to Anson (in contrast, .e.g, to Cheshire and Fifoot, op.cit.), 'there is ... no absolute rule that a contract for the sale of a res extincta is necessarily void in English law' (p.279); whether it is not void or void depends on 'the construction of the agreement', 'whether the seller [or buyer] assumed responsibility for the non-existence of the subject-matter'(!) or neither did, in which case 'the contract is void for mutual mistake' (p.279). Far from this appearing 'the most satisfactory approach to the question of mistake as to the existence of the subject-matter of the contract', it is decidedly unsatisfactory given what preceded it. For it abandons the earlier Strawsonian approach in favour of a two-valued position, validity always arises, but validity is no longer nullified by nonexistence, but depends on what the contract may well not indicate, the intentions of the buyer and the seller to the nonexistence of the goods. More serious, for Anson has at least in the end abandoned the legal Ontological Assumption, is the mistake of trying to treat all cases of nonexistence of the subject matter of a contract as mistake (pp.271, p.276, 279). There need be no mistake.

A more satisfactory approach is Honoré's which avoids entirely the question of mistake:[1]

> the sellers authorize or mandate the buyer to act on the assumption that the tanker [the object] exists. The buyer does so, and incurs expense in the enterprise. The sellers thereby render themselves liable for the expense incurred (p.307).

'For this a conceptual scheme under which we can refer to non-existent objects' is required (p.308).

Area 4. The philosophy of mind. Much of the philosophy of mind consists in an examination of intensional inexistential relations, such as believing, thinking, inquiring, imagining, remembering. Since much philosophy of mind is empiricist in origin and reductionist in outlook, these relations cause serious problems, and are said to be in need of analysis - of some sort, behaviourist or physicalist (central state) reductions or conceptual analyses, reductions and analyses designed to remove any traces of ghosts in the human machines, of the spiritual. But there is no need for (reductionistic) analysis: intensional and inexistential relations are in order as they are.[2] Perception [similarly also conception, ...] is what it seems to be, and what philosophers have agreed among themselves it is not, a relation between a creature, a perceiver [believer], and an object, the thing perceived [believed, commonly a proposition]. The object may not exist, as, e.g., in hallucinatory cases [as, e.g. in 'Saul believed God's word', or where the object is a proposition]. And the relation is intensional; replacement of propositional objects by material or strict equivalents may change truth values. It is the same too for many many other mental notions, e.g. conceiving, thinking, remembering, intending, etc.

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[1] Likewise none of the judges in Couturier v. Hastie 'actually mentioned the word 'mistake', for they considered the case purely as one of the construction of the contract' as Anson worriedly reports, p.277.

[2] By contrast Smart has asserted (e.g. on an ABC radio programme, 1978) that intensional and mental statements such as those about beliefs, desires, likes, and so forth are vague (as Quine is said to have shown, via his arguments on opacity!), suspect, second grade, and in need of replacement analysis or junking. Thus the sciences in which they appear essentially, such as the social sciences, are second grade too. Of course to claim "second-gradeness" for these sciences is to understate the position, since they presumably share the vague, imprecise and suspect character of the statements on which they are based, and so are not really sciences at all.

Carried through this in fact appears to throw out not only most but virtually all of science, so far as science, according to empiricist belief, depends upon observation. For predicates of observation, functors like 'sees', 'observes', 'hears [that]' etc. are, as substitution tests indicate, intensional and exhibit all the leading features which have lead Quine and followers (e.g. Davidson, with his example, which Smart exploits to reveal the "vagueness" of desires: 'a sloop, but not a specific sloop') to claim such statements are vague, imprecise, suspect, etc. But true statements about what people have observed, different people in different and various circumstances, are the major, and according to empiricists, the entire, evidence for the statements of science. If those statements, e.g. 'Observer 1 saw the crystals sink to the bottom of the jar', 'Observer 2 saw ...', are

[2](Footnote continued on next page)

Similarly minds and the objects of mental or intensional activity such as perception, imagination, thought, and so on, objects such as images and thoughts, are substantially in order as they are, and not in need of reduction, analysis or relocation. They do not exist, the logic is not that of transparent entities, but they are, once again, none the worse for that. From this noneist point of view one of the main projects of Ryle's The Concept of Mind (49) is misconceived. That project is to adjust discourse so that discourse about mental objects - which would, Ryle supposes, imply the existence of such objects - is eliminated. But given that one can discourse, truly and quite satisfactorily about what does not exist, such a project lacks point.

Mental objects which are not overt, public, testable, are anathema to Ryle. Much of the detail of Concept is devoted to showing that we can avoid and are very well advised to avoid talking about such objects. Thus, for instance, Ryle writes at the outset of the first chapter of detailed investigation of mental concepts (p.25): 'when we describe people as exercising qualities of mind we are not referring to occult episodes'.

A criticism, like that already advanced (in 1.17 and in chapter 7) of Ryle's account of imagination (Concept, p.245 ff.), can be made of many of Ryle's "rectifications of the logical geography" of other notions. Recall that Ryle tries to sever imagination from its connections with seeing and hearing (p.245) and to dispose of the objects of imagination: thus 'imagining occurs but images are not seen' (p.247). This is a mistake born of the Reference Theory. The objects of imagination are imagined, images are seen; but they do not thereby exist, as Ryle supposes. Rather, as Reid observed (1895, pp.362-3), imagination, which is a species of conception, can easily be of what does not exist.

In particular, a parallel criticism can be made of Ryle's devious treatment of intellectual operations, where it is suggested that such acts as judging, abstracting, deducing, etc. do not really occur, and certainly do not have objects:

> We hear stories of people doing such things as judging, abstracting, subsuming, deducing, inducing, predicating and so forth, as if these were recordable operations actually executed by particular people at particular stages of their ponderings. ... [Such operations] are mis-rendered when taken as denoting acts of which pondering consists (p.285).

The operations are recordable operations, with requisite objects, in which people do engage, sometimes as a part of pondering. So it is also with the operations of sensing and feeling and some of their alleged problematic objects, sensations and feeling (p.199). And so on.

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[2] (continuation from previous page)

vague, imprecise and suspect, then what they are evidence for, the statements based upon them ('the crystals sank to the bottom of the jar'), can hardly be much better. Thus this sort of extreme empiricism has thrown away its ladder. Not just the greater part of, but all of empirical science is suspect. The position arrived at is, at bottom when followed through, a scientifically dressed up form of scepticism.

So it is too with other mental phenomena which have been treated in the manner of Ryle, for example remembering as considered by Vendler 78. According to Vendler, an author can think and work out a novel including all its objects, people, towns, etc., 'without in doing so thinking of anything'. But of course he thinks of something, though not always something existent. Moreover, according to Vendler, the author cannot remember his hero! But again of course he can, much as he can remember a scene from a film. That something never did exist, such as the author's hero, does not exclude its being thought of or remembered. Noneism enables us to return to the track of common sense, which Ryle and Vendler have endeavoured to direct us away from.

The case of perception has already been considered in detail; the case of belief is investigated in some detail in the next section, for the good reason that belief is a central mental notion which, as recognized by Hume and Reid, is involved in or with many other mental notions. But several of the main points made concerning belief and perception go over, with but small modification, to very many other mental relations.[1]

§12. *The commonsense account of belief: A recapitulation of main theses,[2] and an elaboration of some of these theses.*

> ... what is ... belief ...? Every man knows what it is, but no man can define it .... And if no philosopher had endeavoured to define and explain belief, some paradoxes in philosophy, more incredible than ever were brought forth by the most abject superstition or the most frantic enthusiasm, had never seen the light. (Reid, 1895, p.107: Reid is alluding to the theories of Hume and Locke).

1. Belief is a relation, not simply a property. On the commonsense account, as on Reid's account, belief is a relation, relating a believer, a creature, with an object, the thing believed, which may be another creature, or a judgement, or what a judgement is about. For firstly, neither the form 'believes that p' nor the form 'a believes' are well formed. Belief is thus (and somewhat trivially) a relation between a creature, a believer, and an object, the thing believed, which may be another creature or a judgement. In familiar symbolism, Belief = $\lambda x\ \lambda y\ xBy$, where xBy represents x believes y. What Reid takes to be the obvious commonsense account of belief yields the same result (given the logical connection between operations and relations). Belief is a mental operation, the operation depending upon who has the belief (e.g. 1895, p.327, p.108):

> Belief must have an object. For he that believes must believe something; and that which he believes is called the object of his belief (p.327).

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[1] This applies in particular to another example, which like belief is also important and central (and involved in or with many other mental notions, as Spinoza realised), that of desire.

[2] The theses presented overlap those argued for in more detail in Routley^2 75. Some of the theses are however stated more satisfactorily than in the original, and the shape of the core logic of belief now appears much clearer than it was in 1974.

As Reid would have said, the correctness of these claims is self-evident. Although the basic case for the thesis is that it is self-evident, it can be argued for as follows[1]: A predicate ϕ specifies a *relation* if it is sometimes true or false for objects x and y that $\phi(x, y)$, where x is an *object* if it is open to objectual quantification. (There are of course other connected accounts of relations and objects that can be deployed.) Now we can find a and b and p such that

(α) a believes b (on this occasion) and what b says, namely that p,

and such that further (an application)

(α') a believes b (on this occasion), and a believes what b says, and a believes that p.

There is no doubt that 'a' is a subject which signifies an object: all the tests are passed. The doubts that are typically raised about the relation concern its other end. But can there be any doubt that where a believes b, b is a suitable object? Nor can the sense of 'belief' be different, else two-way connections between (α) and (α') would fail. In any case, object tests are passed in the remaining cases. What is the object of a's belief: *what b says*, *that p*? Is it quantifiable? Of course. *Something* is such that a believes it. And identity replacements are in order, e.g. aB what b says and what b says = that p implies that aB that p. Specifically, the identity principle is: if aB§p and §p = §q then aB§q, where '§' abbreviates 'that' and '=' represents (strong) judgemental identity: contingent identities cannot, of course, be intersubstituted.

2. *Belief is sui generis, irreducible, indefinable* except in its own circle. In particular it is not extensionally reducible, and not modally reducible. It is of a very high level of intensionality. So too belief is not susceptible to analysis. But belief can be placed in a network of notions, exteriorised, e.g. knowledge and thought provide upper and lower bounds.

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[1] Although the correctness of the commonsense account of belief is self-evident, there are - in part for this reason, that there is nothing more evident from which it could be derived - difficulties in defending it. There are however ways of defending it. One is to try to adapt Moore's way (59, pp.44-5), and to argue to correctness from features of the common sense view of the world. Moore propounds, and regards as important, two 'peculiar properties' of common sense propositions of the classes he has cited, namely

> *if we know that they are features in the 'Common Sense view of the world', it follows that they are true;* and *if they are features in the Common Sense view of the world (whether "we" know this or not), it follows that they are true.*

This is less remarkable than at first appears, since Moore builds into 'Common Sense view of the world' the assumption that its propositions are true.

A more satisfactory alternative is to argue for the correctness of the

[1](Footnote continued on next page)

To expand on these points:- The relation of belief is sui generis in that, while the predicate B can be paraphrased in terms of predicates of its own circle - giving belief in varying degrees, as, e.g. 'gives credence to', 'puts trust in', 'accepts as true', 'assents to', 'is convinced of', in the fashion of the dictionaries - it cannot be reduced to something outside this circle. In Reid's terms:

> Belief, assent, conviction, are words which I do not think admit of logical definition, because the operation of mind signified by them is perfectly simple, and of its own kind.[1] (p.329)

In certain, but important cases, the irreducibility of belief can be shown, simply enough. Consider, for example, popular hard-headed positions, which tolerate none but extensional (or modal) notions (as intelligible, scientific, worth bothering about, or whatever: the familiar). Belief is not reducible to such notions. For consider the philosophically important case where B relates a believer to a judgement, e.g. to an object of the form §p, i.e. that p, where p is a declarative sentence.[2] Were the relation extensional, p could be replaced by any q, such that $q \equiv p$, preserving truth. But it is easy to find q such that $q = p$ but $xB\S p \not\equiv xB\S q$.[3] The literature on belief is littered with failed attempts to recapture belief in the extensional sphere, beginning with quotational analyses. Again, the elementary logic of belief ensures that no such analyses can proceed: not only do statements of belief translate into other languages perfectly well (Church's argument against Carnap) but statements of belief permit elementary transformations (e.g. active to passive) and derivations (e.g. p & p to p) which quotation prohibits.

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[1] (continuation from previous page)

account from 1) particular common sense truths about beliefs of the form a believes b. 2) analytic truths drawn from neutral logical theory as relations, objects, etc. This alternative way is elaborated in the text - showing, once again that what is self-evident can nevertheless be argued for.

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[1] To which Reid added (tongue in cheek?)

> Nor do they need to be defined, because they are common words, and well understood (p.327).

The history of recent philosophy hasn't exactly borne out this claim.

[2] The judgemental objects of belief may take other forms, such as oratio obliqua, e.g. Yellow Robin may believe a goshawk to be nearby, or deleted propositional form, e.g. a fairy wren believes the copperhead is near its nest.

The non-judgemental objects of belief divide into those that allude in one way or another to judgements, e.g. her proposition, the story, what was said, and those that are holders or makers or judgements, e.g. the storyteller, her lecturer, Bill, ...

[3] This point, like many of those made but sketchily here, is spelled out in Routley^2 75.

A similar replacement argument shows that 'It is believed' is not modal, and so differs logically from 'It is necessary' which is modal, i.e. permits replacement of strict equivalents or provable material equivalents. The more recent literature on belief is sprinkled with failed attempts to capture belief in the modal sphere, especially through possible world semantics. Nor is belief of the order of intensionality of entailment; for replacement of higher degree co-entailments fails for belief functors.

The fact that a (non-platitudinous) analysis of belief of a syntactical type is not to be expected, does not imply that belief cannot be elucidated; it can, by models - such as representation models, e.g. a creature's beliefs are its representation of the world, of how things are - by semantical evaluation, and by exteriorisation. Even though the relation is sui generis, a great deal can be said about it, enough to separate it from many other intensional relations (and to cast into doubt some of the regressive philosophical literature on the topic). A relation can be located not only by interiorisation or analysis, resolution into (simpler) components, but by *exteriorisation*, by placement with respect to larger surroundings. Recourse to the holistic exteriorisation method is appropriate in the case of belief; scope for application of the method is evident:

> Not only in most of our intellectual operations, but in many of the active principles of the human mind, belief enters as an ingredient (Reid, p.327).

An especially important connection is that with conception: xB§p entails xC§p, but not conversely, where 'C' reads 'conceives'.

> Of [the] object of his belief, he must have some conception, clear or obscure; for although there may be the most clear and distinct conception of an object without any belief of its existence, there can be no belief without conception.

Since knowledge entails belief[1], belief is bounded above by knowledge and below by conception: roughly, $K \Rightarrow B \Rightarrow C$.

3. *Belief and conception are intensional and inexistential*; that does not count however against their being genuine relations. Consider belief, which will serve, to begin with, as representative. Belief relates two objects. The relation conforms moreover to the general logic of relations (that of PM, without extensionality). The idea that belief is not a relation, but for instance a property of some kind of the believer, is frequently based on the assumptions that relations can only relate what exists and that the objects of belief sometimes do not exist, as when the objects are false judgements. Although the objects of belief frequently do not exist - no judgements exist (according to noneism), though creatures make and believe them - a relation does *not*, in general, require the existence of its relata; only *certain sorts* of relations, Brentano

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[1] Subject perhaps to provisions, e.g. that SxB§p where SxK§p, where 'S' is the significance functor.

The thesis that knowledge entails belief is, and was always intended as, a thesis restricted to the cases where the objects are propositional, and is not upset (as Vendler and others have supposed) by examples involving non-propositional objects. Certainly xKy does not entail xBy: consider, e.g. "Tom knows the way to the station" and "Tom knows Nixon".

relations, require that. Belief, that is, is inexistential in the second place: xBy does not require that y exists.

It is at this point that the connections of belief with conception and thought become important. For it is well enough known that x may think of y though y does not exist. It is less well known, but the merest commonsense as Reid contended, that the objects of conception need not exist, and may indeed be impossible. The same is true of belief (as is argued directly in Routley[2] 75). As to the first thesis,

> conception is often employed about objects that neither do, nor did, nor will exist. This is the very nature of this faculty, that its object though distinctly conceived, may have no existence. ... every such act [as conception] must have an object; for he that conceives a centaur, he may have a distinct conception of this object, though no centaur ever existed.
>
> ... I know of no truth more evident to the common sense and the experience of mankind ... than that men may ... conceive things that never existed (p.368, my rearrangement).

An essentially similar thesis, but formulated in terms of thought, is included in Moore's truisms, or axioms, of common sense:

> I have had expectations with regard to the future, and many beliefs of other kinds, both true and false; I have thought of imaginary things, and persons and incidents, in the reality of which I did not believe (59, p.34).

The second thesis, Reid states a little less directly, but nonetheless clearly enough:

> There remains another mistake concerning conception which deserves to be noticed. It is - that our conception of things is a test of their possibility, so that, what we can distinctly conceive, we may conclude to be possible; and of what is impossible we can have no conception (p.376).

Belief involves more than conception (as the content of belief properly includes the content of conception), so it would be invalid to infer corresponding features of belief from those of conception. However a rickety bridge can be made. What a belief that p amounts to over conception that p is something like (though this will afford no satisfactory syntactic analysis): assenting to the truth of p, nodding to p, certifying p as true.[1] One can conceive what does not exist, such as a false or impossible proposition, and certify it as true, assign it to one's true box.

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[1] Thus a fuller semantical analysis of xB§p will presumably include a clause to the effect that $p \in T_x$, p is among the truths as x sees (conceives) them: see below.

But such moves are no real substitute for the direct case, from examples, for the theses, again commonsense theses, that belief is inexistential and that one can believe what is impossible.[1]

The other main basis for the thesis that belief is not a relation is the intensionality of belief, the intensionality of belief being established by examples (along the lines already set out in 2). Intensionality is identified with opacity (mistakenly, but the mistake is not material for present purposes, since opacity of belief can be granted[2]), and the opacity of belief applied to discredit the assumption that belief has an object or objects - since objecthood requires clearness and distinctness, or at least clear identity criteria; but in the case of the "objects" of belief the requirements are not satisfied. Though the requirements can be met, they should not go uncontested (see chapter 4 above). The objects are, moreover, open to (neutral) quantification in the ordinary way, as when we argue: if x believes that (...) then x believes something false. Etc. In sum, neither the intensionality nor inexistentiality of belief, though undoubted features of belief, affect the relational account of belief or the thesis that belief has objects.

It is a corollary of the relational account that theories that would reduce belief to a property of believers, such as adverbial theories and some dispositional theories, are mistaken. Consider, for example, Armstrong's claim (68, p.245):

> Most modern philosophers accept the view that to say that A believes p is to make a dispositional statement about A. I think it is clear that they are right. Now if to say that A believes p is to make a dispositional statement about A, then, ..., we are implying that A is in a certain state, even although that state can only be described in terms of its manifestations.

If the modern philosophers thereby mean, as they usually do, that belief is not a relation, but only a dispositional property, or state, of A, then the view should be rejected: it has left out fundamental features, relationality, and the objects of belief. The account Armstrong elaborates certainly does. So does the account which made the dispositional view famous, Ryle's. Ryle restricts dispositional statements to those ascribing properties from the outset:

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[1] The main arguments are indicated in Routley^{2}75, especially §11, and need not be repeated here.

It is worth noting however, that the number of serious thinkers who genuinely believe explicit contradictions, such as those yielded by semantical paradoxes, and who are not merely prepared to entertain the hypotheses that the world (as some totality of propositions is inconsistent, but affirm that it is, is on the increase. These beliefs appear to satisfy, furthermore, all usual behavioural criteria for belief. No adequate theory of belief can simply dismiss such beliefs as not occurring.

[2] However tricky determinable phrases such as what is believed can have both opaque and transparent determinates; contrast $\iota y\ xB...y...$ and $\iota y(Pz)(y = z\ \&\ xB...z...)$, where 'ι' symbolises neutral 'the', 'P' neutral 'some' and '=' extensional identity.

> dispositional statements, namely, statements to the effect that a mentioned thing, beast or person, has a certain capacity, tendency or propensity, or is subject to a certain liability (49, p.127).

The metaphysical advantages of the contraction of a relation to a property are evident enough, the way is made easier for reductions of belief to what it is not, whether reductions of behaviouristic sorts or central state theory. If belief is not simply a state of a believer, but a relation, these reductions are complicated - though not thereby ruled out.[1] Nor is some account of belief as a semi-dispositional relation - a relation which is dispositional in its first place, so to say - excluded. However, whatever plausibility Ryle's account of belief as a tendency (pp.133-4) had - it should never have been much - diminishes further when the relationality of belief is properly considered.[2]

4. The objects of belief in cases which can be given the form aB§p are, at a surface level, propositions. In terms of a neutral theory of propositions, according to which propositions are certain objects which do not exist, a solution of various important puzzles about belief and truth can be given (the details are to be found in 1.23 above).

However the analysis can always be deepened because sentences expressing propositions always have subject-predicate form and so are about something, something to which the believer relates. For example, the statement 'Weingartner believes that Pegasus is winged' which states a surface relation between Weingartner and the judgement that Pegasus is winged, at a deeper level yields a relation, again inexistential and intensional, between Weingartner and Pegasus. Put differently, xB§p is of the fuller form xB§yf, which yields a relation between x and y of the form $xR^{t}y$ for appropriate relation R^{t}. In more complex cases where that statement has multiple subjects, the relation can be represented as between a believer and several objects, i.e. as a many-place relation.

The procedure of deepening the relation may be rendered formally secure as follows: where xBA and A is about $y_1,\ldots,y_n$ (e.g. according to the theory of aboutness of Slog, chapter 3), then x stands in the deeper relation to $y_1,\ldots,y_n$. By deepening, which can always be effected, propositional intermediaries (which are not too fancifully viewed as fictions) can be left behind, and relations to bottom-order objects often obtained. Thus belief is built, in something the way Russell tried to show with his multiple relation account of belief, on relations between objects; only neither the initial objects nor the relations are restricted, in the ways Russell supposed, to the existent and the extensional.

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[1] The problem of finding an extensional identity, or more weakly a correlation, between what is believed by a believer on the one hand and the believer's neurophysiological state and condition on the other, is rendered no more difficult than before, e.g. on quotational or property theories. Representations of what is believed (e.g. of a logical type) are not difficult to devise; but whether they bear any good relation to neural circuitry and arrangements is quite another matter.

[2] By what tendency is x relation to p when xB§p? Presumably, x tends to behave in ways (to say or do things) connected with the assertion 'p' is true. But it is difficult, to say the least, to fill out the connection satisfactorily. Even with notions of the belief circle such as affirms, the account fails since x may exhibit no such tendencies, or exhibit them though no belief is held. Also the quotational part causes trouble. As to just how exactly belief is supposed to be a tendency, Ryle offers almost no help.

In deepening, to replace relations like belief by more ordinary relations on bottom-order objects, an important difference between belief and such notions as perception emerges. In the case of perception, which naturally encourages deepening, the relation transfers to the new object; specifically, xP§yf, where P represents 'perceives', implies that xPy.[1] Similarly conceiving transfers. By contrast, xB§yf does not imply xBy.

The further theses involve a progressive refinement of commonsense. That is, the fuller account is attained by a conservative extension of commonsense, in the sense explained in chapter 6.

5. Belief has a nontrivial logic, but the logic is not modal in character. Belief systems are more than mere lists, but satisfy certain unremarkable closure conditions, though not closure under logical consequence. The claim (again argued in Routley^2 75) is that there is a logic of belief, a set of core constraints which apply to the beliefs any believer can hold. All these principles, take however, a conditional form, namely if xBA then xBC for certain related C. There are no propositions one has to believe. Correspondingly there are none one cannot believe. A corollary is that the laws of thought are a myth, i.e. there are no logical theses of the form xBA (as distinct from contingent truths).

The logic of belief is characterised as much by what is rejected, by rejection principles, as by what is asserted, by assertion principles. Thus, for example, ⊣ if aBp & p → q then aBq. Similarly, and at least as important, ⊣ if A ⇔ B and aBD(A) then aBD(B); i.e. entailment replacement in specifically belief contexts fails. This is not only the key to what is wrong with the paradox of analysis: it also indicates the form a semantical analysis of belief will take.

6. The relational account of belief leads directly to a semantical evaluation rule, of the following form at actual world T: I(xBA, T) = 1 iff $\underline{\underline{R}}^x[A]$, where [A] gives the range of A, i.e. the worlds where A holds. However in the light of the principles that hold, and fail, for belief the evaluation can be simplified to:

$$I(xBA, T) = 1 \text{ iff for some } b \text{ such that } T_x b,\ I(A, b) = 1,$$

i.e. that x believes A is true (in the model) iff for some world, the world of x's beliefs, A holds in b.[2] The semantical analysis yields a representation model: what x believes is a matter of x's representation of what is the case, which is given by a world. More picturesquely, a creature's beliefs give its picture of how its part of the world really is. This can be put in terms of Ramsay's map metaphor (as elaborated in Armstrong 73), but a map representation is much more limiting since there is much that can be or is believed that is not too easily or at all naturally represented on a (conventional) map. And the map in question is seriously incomplete: it only represents that part of the world the creature is suitably informed about.

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[1] There are everyday uses of 'perceives' which violate this condition (see above); so strictly the contrast made needs tightening up.

[2] Observe that this worlds semantics for belief can be reworked functionally (i.e. in terms of valuation functions only) without worlds at all: see Routley and Loparić 78.

7. The main and interesting logic of belief and propositional identity is frozen at the first degree stage. Given this thesis, the semantical evaluational rules for the higher degree, i.e. at worlds c other than T, is made simple:

I(xBA, c) = 1 if the model so assigns, i.e. the value at c is arbitrarily assigned.

8. Belief is systemic, i.e. a creature's beliefs form a system. But beliefs can be both amalgamated and separated: believing A & B just is believing A and believing B. A holistic view of belief is mistaken because simplification holds within beliefs, i.e. if xB(C & D) then xBC.

9. Belief systems may well be inconsistent; furthermore a creature may believe in explicit contradictions, such belief may be quite rational.

10. Belief may be viewed (though somewhat artificially) as consisting of two components, an assumption or thought component, giving the content of the belief, and a conviction moment or component. For to believe something is to take (assume, conceive) it to hold, in a, and to take it to hold true, i.e. to hold in T. Thus Meinong, Frege and others, not only as regards belief, but as regards (for instance) assertion, which can be seen as comprising an assumption component plus a presentation moment. To what extent can these features be worked into the semantics? The rule for assumption is like that for belief apart from the replacement of belief world T_x by assumption world A_x, i.e. the world of x's assumptions. What distinguishes T_x is undoubtedly its assumed connection with T, this is the conviction moment. What holds is not that $T_x \not\subseteq T$, for x's beliefs might be false. Nor is it that x takes T to include T_x. Firstly, semantic purity has been lost; for in effect a belief functor has been put into the semantical theory, to give "x believes §($T_x \not\subseteq T$)". Secondly, the assumption has the same sort of things wrong with it as the syntactical principle that approximates it, namely xB(xBA → A), x believes whatever she believes is true. No properly modest person, who believes in her own fallibility, believes such a proposition concerning herself. Can this principle be improved upon syntactically? It seems not (except by the trivial and unhelpful principle xBA → xBA). It seems a good conjecture, on the basis of a search of principles, that there are no systemic principles formulable within the logical framework so far indicated which would isolate the conviction component and distinguish belief from assumption. This conjecture can, moreover, be defended, for example initially as follows: any such principle would have to take the form xBD; but a fortiori there are no such logical principles.

The (artificial) separation of belief into components thus delivers Hume's legitimate problem - what distinguishes belief from mere thought?

11. Hume's problem may be resolved by way of the logic of inference. There are two directions in which to seek the desired discrimination between belief and

mere thought, namely through (1) exteriorisation - interconnections with functors such as those of cause, desire, inference are obvious and familiar candidates - and (2) use of mixed metalinguistic principles. Though both courses are worth pursuing, (2) leads back eventually to (1). The key lies in the connection of what is believed with T, which can be expressed (more satisfactorily than in the previous attempt in 10) thus:

(CF) If xBA then xB(A holds in T), or

whatever x believes, x believes to hold true. CF and its converse yield what Davidson (75, p.23) has now called the redundancy theory of belief, namely

(RD) xBA iff xB(A is true).

The problem with mixed semantical principles such as CF and RD is how to make them logically informative, how to cash out x believes that a holds in T. The most conspicuous logical feature of accepting a statement A as true is being prepared to detach from it in an implication or to use it as a premiss in inference. An initial formulation of the distinguishing feature is then

(CF^+) if xBA then x is prepared to use A as a premiss in inferences.

This important feature has been noticed, but in the too limited context of practical reasoning, by Armstrong who suggests (73, p.74): 'beliefs are, thoughts are not, premisses in our practical reasoning'.

In order to obtain a more formal expression of (CF^+) we relativise (to x) the standard logical notation: $A_1, \ldots, A_n \vdash B$, which may be read roughly 'from premisses $A_1, \ldots, A_n$ one may infer B'. The new notation $A_1, \ldots, A_n \vdash_x B$ reads approximately 'from $A_1, \ldots, A_n$ x may infer B'. The detachment of beliefs rule (a sort of cut rule) can then be stated

$$\frac{xBA \qquad A, A_1, \ldots, A_n \vdash_x B}{A_1, \ldots, A_n \vdash_x B}$$

A parallel detachment of mere thoughts rule evidently fails. The well-known action guiding character of belief is a corollary of the rule; for a person's beliefs supply premisses in his practical reasoning about what action to take. The rule also explains why one cannot rationally adhere wittingly to false beliefs; for then one would be prepared generally in actual situations to detach from premisses one recognised to be false, which is hardly rational.

Given that the theses advanced under 1-11 are near the mark, (practically) all other accounts of belief and its logic of explicitness in the literature are defective.

§13. *Corollaries for the logic and ontology of natural language.* An important corollary of the illustrations is this:- The classical logical position is regarded as having a rather unquestionable status these days: it is (so it is said) the rational, scientific position: it has the status of a received theory: it is the status quo. It has made a pretty clean sweep in most places where Anglo-American influence reaches, to a point where alternative non-classical logics are widely regarded as deviant, wayout ones. But as we have seen the received position implies by fairly direct steps positions in epistemology and elsewhere which are quite widely regarded as doubtful or debatable - certainly, unless philosophy has sharply changed, not ones which have the status of a received theory. But if p leads to q, and q is debatable, then p is debatable. Applying this principle, it appears to follow that matters taken for granted in the classical theory are not nearly as cut and dried as the adherents of such a theory would have us believe. Unless direct realist theories of perception, for instance, can somehow be written off as miserable superstitution, it would appear that classical theories cannot correctly make the claim to rationality, adequacy, and scientific respectability that they actually seem to be able to get away with making. One upshot is a case for a good deal more toleration towards alternatives and their investigation, and for less dogmatism in the wiping out of logical alternatives than is usually displayed. Such dogmatism involves a turning away from the best traditions of philosophy. In epistemology, for example, there have indeed been fashions, many of which seem amazing to people under the sway of later fashions, but there has rarely been a time, certainly not a recent time, in free philosophical discussion, when one of these positions was regarded as having the status of a received doctrine, to the extent that challenges to it were regarded as ratbaggery, as worthless, or a waste of time, or so that there was regarded as being just one position that an informed person could hold. Yet classical logical theory, though no less debatable, has virtually reached that state, at least with many of its adherents, and certainly in many places.

A much superior choice as working logical theory for investigating the philosophical problem areas considered, and others, is that furnished by (radical) noneism. The superiority of radical noneism over classical logic can be argued by way of models for theory choice, for example, by optimisation models in the fashion of Routley 79, or from accounts of theory growth as in Priest 79a. It can also be argued in other ways, in the ways of this book, and directly as in the following type of argument designed to indicate that the logic and ontology of natural language is noneist:-

Only a direct treatment of statements about nonentities can reflect ways in which we correctly talk about them in natural language. The argument derives from the character of highly intensional functors such as belief.

1. A belief concerning item x is not equivalent to a belief concerning anything other than x, where the identity determines for 'the same item' are stringent, and certainly exclude such factual identifications as round squares and ordered pairs consisting of null sets and other set theoretical fandanglry (unless the belief concept itself is totally reanalysed, as something else other than ordinary belief, but such analyses have been objected to on several other grounds in 1.7).

2. But the item about which we can and do have beliefs, as delimited under 1, include, as a simple matter of quite hard data, not only nonentities but also impossible items.

3. To account for the way in which we operate with belief notions, to account for the things which we can, as a matter of quite hard data, truly say in natural language about beliefs, etc., it is necessary that such items be able to occur as full logical subjects, be quantified over, etc.

4. Classical logical theory is, as has been seen, inadequate to the task delineated in 2 and 3, but radical noneism is not. Thus

5. Classical logical theory, in contrast to noneism, is inadequate to account for what is said in natural language. It is inadequate in fact on both intensional and inexistential fronts. For, to mention the inexistential, natural language does not carry, or lead to, the load of ontological commitments that philosophers in the classical logical mould would attribute to it. In natural language, which readily mirrors, and facilitates the presentation of, commonsense theses, one can and does correctly talk of what does not exist; and, as a matter of commonsense, many things that are spoken of, sometimes truly, do not exist.

It is one thing realising and showing the inadequacy of classical logical theory, in particular for major philosophical and linguistic purposes; it is quite another turning around the entrenched classical logical programme[1], which keeps reappearing dressed in new gear. The last trendy garb for classical theory, and ever-associated empiricism, is advertised under such appealing headings as 'the philosophy of language', 'the semantics of natural language (or Davidsonian) programme' and 'the philosophy of action'.

Philosophy of language, for example, as generally practised, is simply a reattire and face lift for classical logical theory and associated empiricism. And really it is a rather hopeless attempt to fit the data of language into the procrustean bed of an old model which cannot explain crucial elements of it. Comparison with a new physical theory, such as quantum theory, which supersedes classical physical theory, is revealing. The moral for currently fashionable, but essentially classical, logical theories masquerading under the title 'philosophy of language', is that one should not refuse to recognize data because it cannot be explained in terms of an old model, or persist with obviously hopeless attempts to fit the data into an old and defective model even if it is dressed up in new attire. One should recognise that the old model, even if it feels comfortable and familiar, is inadequate to explain the data and observable facts, that it is inadequate to account for and explain the world. Such an approach would lead us to recognise nonreferential occurrences for what they are, just as it leads to recognition of nonclassical objects such as quanta, even if these objects fit ill into the older model (indeed threaten to destroy it) and lead to much discomfort. The new "philosophy of language" is not in these terms a genuine methodologically-sound study of language and semantics at all; it does not attempt to explain data so much as to bend it[2] or to dismiss it where inconvenient, etc.

Similarly the "semantics of natural language programme", promoted especially by Davidson, that is often taken as part of the new "philosophy of language" is less a genuine theory of language or truth, of how we can truly say the things we do, than once again a fashionable face-lift and reattiring of classical logic and empiricism, an attempt to fit the data in with an old model (using a few newer tools drawn from Tarski's semantical theory of truth) which discards, through a variety of unsatisfactory theory-saving devices, what does not fit or cannot be retailored to fit.[1] It is less an attempt to account for features of language and the world than another attempt to impose an unsatisfactory model on it.

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[1] As it is turning around any deeply entrenched theory: see 11.4.

[2] Characteristic is the finding of ambiguities in natural language where none are manifest or need occur.

Nonreferential occurrence, manifested in the intensional and inexistential, is a crucial part of the data of language which cannot be explained away or reduced to referential. In recognising and allowing for the mode, without attempting to reduce it to something considered more familiar, or to explain it away as something else, noneism has a different methodological approach to its rivals. It does not attempt like other theories to try to reduce it into the preconceived model for language of the Reference Theory and its elaborations. In this respect it differs from multiple factor theories as well as from those which assume everything can be done in terms of one factor, reference.

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[1] The methodology here, presupposed and applied against classical based rivals is further considered and defended in 11.3 ff.

CHAPTER 9

THE MEANING OF EXISTENCE

Existence is, as Russell once remarked (37, p.449), a prerogative of only some among objects. Some things still exist, e.g. natural forests, and some things do not exist, e.g. dryades. The main problem is: which things exist, and what - since a mere listing of (some of) those things that exist and of (some of) those that do not exist is inadequate because hardly effective given the infinity of objects and because incapable of resolving hypothetical cases - is the demarcation criterion? For a suitable (intensional) criterion answering the question 'What exists?' if it can be found, will enable existence to be satisfactorily defined by abstraction: existence is the property of all and only these things that exist ($E = \lambda x E(x)$). And this answers the question 'What is existence?' and gives the meaning of existence, in one sense - the semantical sense - of 'meaning'.[1]

Although the predicate 'exists' can in principle be treated as primitive and left unanalysed and unexplained, it is important, especially in rejecting such charges as those of platonism, and for the working out of what ontology is really about, that some conditions at least be provided on existence. Thus even though existence is a rather more honorific notion once the Reference Theory is rejected, and less hangs on its attribution especially for what can be truly said, nonetheless it is important for logical theory to try to explicate the notion.

§1. *The basic problem of ontology: criteria for what exists?* Although the problem as to what exists is the core problem of ontology, and so one of the central questions of philosophy, it is a problem that recent mainstream logical theory has tried hard to dispose of or avoid. The referential doctrines encapsulated in nondeviant modern logic, in particular the Ontological Assumption (according to which what does not exist has no properties, true discourse is never really about what does not exist), have converted existence into a sort of logical football to be kicked around with choice of bound variables and their associated entity domains; that is, existence is not treated as a stable independently characterisable notion, but rather as something to be pushed hither and thither to meet the requirement of *rendering* in some fashion all true discourse (or at least all minimally indispensible discourse, e.g. so-called scientific discourse) as about entities, i.e. things that exist. For as pointed out in the discussion of universals, given the tensions of that unhappy menage a trois between, *one*, what can truly be said, *two*, what exists in the ordinary sense, and, *three*, the Ontological Assumption, *something* has to give and it is usually the account of existence. Existence comes to be something to be manipulated in the interests of maintaining the Ontological Assumption without sacrificing minimal discourse; and what is said to exist may come to bear very little relation to what is ordinarily thought to exist. The slogan: to exist is to be appropriately included in a linguistic framework, to exist is to be the value of a bound variable, typify this sort of approach, and the way in which recent logic has avoided and subverted the real question of what it is to exist.[1] The question arises again however with full force, and assumes its traditional interest and importance, once the Ontological Assumption is rejected and what exists properly severed from what can truly be said. In fact an unfettered investigation of the problem of existence appears possible only with the rejection of the Ontological Assumption, and upon going beyond the actual and looking at what exists from both sides, from the outside as well as the inside.

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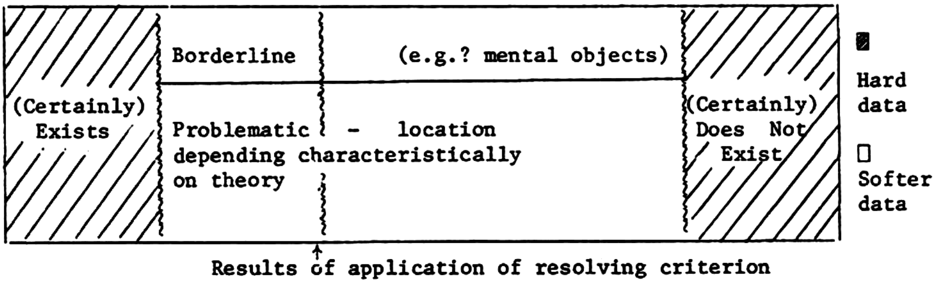
[1] The other, quite proper, questions encompassed under the question 'What is the meaning of existence?', e.g. as to what is the point or purpose, if any, of existence, or creature existence, are set aside for another time and place. Also set aside are questions existentialists have raised as to what it is to really live or to be fully alive. For these use 'exist' in a different sense, namely an extension of the third sense, to have life or animation; 'to live', given in the OED.

The relevant sense of 'exist' is the OED sense 1. 'To have place in the domain of reality, have objective being'.

According to Munitz (74, p.xiii) the genuinely philosophical problem of existence is that of a systematic analysis of the meaning of 'existence', which can be separated from the different, though related, problems of existence, such as the explanations of the existence of the physical world and of the mystery of existence. For an interesting, if fundamentally mistaken, recent philosophical approach to the latter questions, see Munitz 65.

Despite the impression Carnap and others have given, not anything goes as regards what exists, not anything can be said to exist: (even if put in a favourable linguistic framework) there are constraints, both on what can and what is said to exist and on what is said not to exist, imposed by the ordinary usage of 'exists'.[2] In virtue of this usage too the notion is much more stable than logicians have allowed. Even so, there is a large intermediate class of objects whose existential status is in doubt, or thought to be in doubt, and in dispute. In particular, there are with 'exists', as with many predicates, borderline cases, and there are other cases in which usage is theory dependent. There remains a substantial area, however, which is not theory dependent and in which there is broad agreement that certain sorts of things clearly exist and certain other sorts of things clearly do not exist in the ordinary sense. In short, there are at least four classes of cases to distinguish, which may be represented pictorially thus:-

Initial diagram of object space (i.e. of d($\underline{\underline{T}}$))


Borderline
(e.g.? mental objects)
(Certainly) Exists
Problematic - location depending characteristically on theory
(Certainly) Does Not Exist
■ Hard data
□ Softer data
Results of application of resolving criterion

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[1] See especially Carnap MN, p.205 ff., and the discussion of Carnap's material below. See also Quine WO.

[2] As well as by the logical requirements, such as consistency and assumptibility already discussed.

Almost everyone will agree that the following sorts of things certainly exist; nuclear power stations, Stuart Sutherland, greater gliders, ... Likewise almost everyone will agree that the following sorts of things certainly do not exist: Escher's impossible buildings, mermaids, Sherlock Holmes, ...(No mermaids exist is true, though many philosophers would prefer to try to express the truth differently). Since this agreement is not based on rote or list learning of things that exist or on authority or other sources of this kind, it is presumably based on the use of common criteria for the use of the term 'exists'. There must be such criteria (and lower and upper bounds on what can be allowed as existing): to discover what the criteria are is an important part of giving an account of existence, but of course it is not the only part. There are also the theory-dependent areas, and it is in these areas that disagreement commonly arises and the impression produced that there are no constraints, that the area is a hopeless quagmire. The theory-laden class enters through theories, especially through philosophical theories of truth and meaning, some of which have been popularly absorbed, in much the way that other theories (enough of them mistaken) are. By no means all theoretical items belong to the theory-dependent cases: idealised particulars such as the frictionless bodies, perfectly smooth surfaces, and so on, of scientific theories do not exist and are, ordinarily at least, reckoned not to exist. Likewise in the ordinary sense of 'exists' such objects as Aristotle and the first fusion power station do not exist (the Minkowskian picture that encourages philosophers to say these purely past and future objects all do exist introduces its own, quite extraordinary, sense of 'exist'). In contrast to these cases where usage is clearly determined but there is an attempt to change that usage, the usage concerning further classes of items is not, it seems, determined (though very often ordinary usage appears to settle against existence of any more esoteric objects). Such theory-dependent uses almost inevitably occur with certain abstractions, to take a major example. There is then no widely agreed upon usage for theories to change, but there is a gap for theories to perhaps fill. What one says about the theoretically dependent cases, what one says about the existence of the Triangle, properties, propositions, sets, numbers, theories and such like, unlike what one says about the existence of Aristotle or dodos or greater gliders, depends very heavily upon one's theory of meaning and truth.[1] Thus, for example, a whole class of ways of dealing with abstractions - by introducing subsidiary kinds of existence, e.g. exists theoretically, exists in the mind, and uses of 'exists' in a broad platonic sense to cover all those classes of abstractions which are thought indispensible for (scientific) discourse - are heavily theory-dependent, and in fact generally dependent on reference theories of meaning and truth (the RT again). Users of these terms will usually agree that the theoretical items do not have ordinary concrete existence, but insist on this terminology because they wish to continue to speak truly about them and adhere to the theory that true discourse can only proceed through reference to an existent subject, in short the Ontological Assumption and the Reference Theory. In contrast, a noneist will reject these usages as involving a theory of meaning he rejects and insist that such things do not exist and there is no need, and no case, to say that they exist. There is no need because one can speak truly, and generally, of what does not exist. The noneist will suggest that such usages serve to prevent examination of, and realisation of the inadequacy of, the Reference Theory, and that insofar as they suggest that the items claimed to exist in such platonistic sense have concrete existence, are the sort of items likely to be encountered in the real world, they are misleading or obscure, and hinder the obtaining of an adequate account of existence.

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[1] The aspect of trivialising real issues that so much of recent Oxford ordinary language philosophy presented in its appeal to ordinary usage, derived in large part from the neglect of these theory-dependent areas of usage, and in particular of the theories of meaning and truth associated with them. The converse also occurred - heavily theory-dependent usages were passed off as unshakeable "hard data" - ordinary usage. For example, the existence of universals and therewith the underlying ontological assumption, were extracted from "ordinary usage".

For similar reasons noneism sets aside other kinds-of-existence doctrines (and parallel multi-criteria accounts of existence), approaches that reach their extremes in such theses as that every sort of object has its own sort of existence or that every discipline has its own kind of existence, e.g. geographical existence, historical existence, fictional existence, legal existence, mathematical existence, etc. etc. For these theses which are pushed to absurdity by multiplying distinctions of subjects - are underpinned once again by variants of the Ontological Assumption: without the assumption such kinds of existence doctrines are quite unnecessary. Moreover it is always a legitimate question whether what has t-type existence (e.g. parliamentary existence, mycological existence, grocery existence), does exist or not - not exists in some other way, but exists simpliciter.[1] Kinds-of-existence doctrines store up problems as to how objects having this or that kind of existence relate to objects having other kinds of existence and to what exists simpliciter and also problems as to the modes of existence of objects that do not exist simpliciter but in this or that way. These problems provide the bases of many objections to kinds (and degrees) of existence doctrines (e.g. Anderson's questions about relations of members of the kinds[2]), and thereby part of the case for the only-one-way-of-being theses common to empiricists such as Anderson and to rationalists such as Meinong, namely there is only one way of existence, being in the domain of

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[1] It is not quite automatic that 'exists' is univocal; whether there is just one sense turns on criteria for the sameness of sense. But the linguistic evidence suggests that the sense sought, that separated out from the OED senses for investigation, is a single sense. Not too much turns however on the issue of whether there is a single sense given that a single sense can be tied to different criteria.

[2] The argument, despite its initial promise, is difficult (perhaps impossible) to reconstruct in satisfactory form; for it depends on a circumscribing of what counts as a relation which has little justification. One fairly general version of the argument is as follows: let a exist and b be an object having f-existence and let R be an empirical relation for which aRb. Then since a exists and R is empirical b exists, so f-existence is otoise. Alternatively, there are no empirical relations relating existents to b: but then b's f-existence is totally unverifiable, and b does not exist.

The argument has several defects. But to put the argument in its best light let the relations considered be Brentano-style relations which do transfer existence. Then the first half of the argument is correct, as

(footnote continued over page.)

empirical reality, i.e. existence simplicter.[3] The rubric is however compatible with the One Way being delineated by rather different criteria.

Application of the term 'exists' to such items as abstractions, then, is heavily theory-dependent, and pretheoretical usages of 'exists' tend to leave it open whether such things exist, i.e. they leave the area open for the invasion of theories, including noneism. So one is not violating any accepted usage by saying that such items as Time, the Triangle and numbers exist, and one is not violating it if one says that they do not. In contrast to the pretheoretical usages, the satisfactoriness of such theoretical uses is not determined by pointing to a widespread belief or convention, but by the adequacy and correctness of the theory with which the theoretical usage is associated. The difference between someone who wants to say that such abstractions exist in the mind, in theory, or exist platonistically, and one who says that they do not exist at all, is not then the difference between two different but equally agreed conventions, but the difference between two theories, one of which may be more adequate than the other to account for the hard data presented by what can certainly be said.

It may be however that various theoretical uses can be eliminated by showing that they rest on bad or shaky theories or (and this will be a main strategy) by showing that the convergent cluster of criteria that lie behind the hard data of ordinary usage serve to rule out the theoretical assumptions.

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[2] (Footnote continued from previous page).

far as b's existence is concerned. But the second half breaks down; for a and b may very well stand in other kinds of relations, e.g. intensional relations. No sort of verification principle will then bridge the gap to unverifiability, or the leap therefrom to nonexistence.

Examples of arguments of this sort, against types of existence or multiple world theories, are examined in interesting detail in Passmore 70. Observe that if arguments of this sort did succeed they would show that what is quite satisfactory and certainly consistent, multiple world modellings of intensional logics, is impossible. The main line of argument is as follows (cf. p.42): if a and b which are of different worlds, or exist in different ways, are brought together by a relation (such as participation) then 'tjey are automatically taken to belong to a single realm of being'. That is not so, but only holds good for certain sorts of relations. The remainder of the argument is that if a and b are not related in such a way, then the worlds are 'split apart, and (additional objects) become quite otiose'. Again that is not so; for intensional relations such as those of explanation can link the objects of different worlds. And sadly, the argument seems beyond repair.

[3] Meinong says, in GA, vol 1, that there is only one kind of reality, empirical reality, and that so-called fictional reality is no reality at all. On Anderson's position see 62; also Passmore 70. In another sense, however, Meinong is committed to an (erroneous) levels-of-being doctrine: see 12.2.

The One Way thesis is incompatible not merely with more extravagant kinds-of-existence doctrines but also with theories such as those of Moore and the early Russell, and recently Margolis 73, which distinguish existence from being, being being a further sort of existence.

The evident question is then: what are these demarcation criteria in virtue of which we distinguish those things that exist from those that do not. A great variety of criteria have been proposed, often without any justification or their base being made at all clear. Some of these criteria can be dismissed at once as conflicting with the hard data, e.g. any criterion that entails that impossible objects exist and any criterion that entails that nothing at all exists (naturally there may be other things of importance to consider in the arguments). Also we can readily set aside various

I. Correct but trivial criteria, and

II. Obviously mistaken criteria,

and move to

III. A classification of remaining criteria.

ad I. *Correct but trivial criteria*, which any possible theory can conform to or supply.

Example 1: To exist is to instantiate existence, i.e. $E(x)$ iff $(\lambda x E(x))(x)$, which is an immediate application of λ-abstraction. The account Russell offers (in 37, p.449) is scarcely more informative, namely 'To exist is to have a specific relation to existence'. For the unexplained 'specific relation' has to be tantamount to none but instantiation. Many of the criteria we consider in more detail in fact only enlarge the circle evident in Russell's account a litte, the circularity is just a little less transparent.

Example 2: What exists is *everything* in the sense of the universal quantifier $\forall$ of classical logic (cf. Quine FLP, p.3). But in this sense *everything* is equivalent to *everything existent*. And certainly everything existent exists. $(\forall x)E(x)$ is a basic logical truth of free logic, which can be reexpressed classically given identity, since $E(x) \equiv (\exists y)(x = y)$, as $(\forall x)(\exists y)(x = y)$; and $(\forall x)E(x)$ expands to the trivial theorem $(Ux)(E(x) \supset E(x))$ of neutral logic. In short, the answer 'Everything', where the term carries existential loading, is correct but trivial; and it will follow on any satisfactory logical theory. However in the larger sense, where 'everything' means 'every thing', i.e. 'every object', not everything exists, for any objects do not exist.

Example 3: To exist is to be the value of a bound existentially generalisable variable.

Example 4: To exist is to have the property of satisfying the criteria for existing (Margolis 73, p.109, also p.92). Such an analytic connection does nothing to separate 'exist' from a wide range of other predicates, such as 'is good', 'is beautiful'. Admittedly, though, this account does appear to conflict with such theses as that existence is not a predicate and that there are no marks or tests of existing; but it hardly conflicts in a serious fashion, since the theses were never intended to, and hardly could, banish 'exists' as a grammatical predicate (cf. 1.17).

ad II: *Obviously mistaken criteria*.

Example 1: To exist is to be the value of a bound variable (cf. Quine).

Example 2: To exist is to be consistent (a thesis sometimes associated with Hilbert). It is quite evident however that many novels are consistent, yet their characters do not exist. There are any number of consistent (or possible) objects that do not exist.[1]

Example 3: To exist is to be an element of a good theory (cf. Sellars). A good theory (Newtonian mechanics as fairly fully elaborated in the nineteenth century was one such) may contain many elements that do not exist, e.g. ideal particles and other objects, virtual forces, etc., etc. Conversely objects that exist may be included in no good theory. The thinking behind this criterion appears to be the pragmatist equation of truth of a theory with its goodness. But even removing this defective linkage does not conspicuously improve things.

Example 4: To exist is to be an element of a true theory. The equivalence fails for the same reasons as before. True theories may well exploit theoretical objects that do not exist; and true theories may well be incomplete. Incompleteness is perhaps reduced (to the extent that limitative theorems permit) in the unobtainable limit, total correct science, but use of ideal theoretical elements may well not be. Thus the idea (in Armstrong 78, e.g. II, p.8) that what exists is determined by total sciences is mistaken - unless of course total correct science includes a correct ontology or (what is also unlikely given the possibility of neutral recasting of theories) uniquely determines its ontology.

Example 5: Variants on the Ontological Assumption, e.g. to exist is to have properties, to exist is to be the object of facts, to exist is to have physical properties, etc., etc.

Example 6: The definitions of Lesniewski's Ontology, namely, an a exists iff, for some b, the b is an a, i.e. There is something that is an a; and, the a exists iff, for some b, the a is a b, i.e. there is something that a is. The definitions presuppose the Ontological Assumption. Without that assumption they are readily counterexampled. For example, the mountain I am thinking of is a golden one, but it does not exist.

And there are many other examples of plainly mistaken criteria (for one striking example see Redmon 73).

The rejection of all these criteria, especially variants of the Ontological Assumption, has a substantial bearing on the method adopted in what follows. In particular, the question of whether a exists has nothing to do with whether all discourse where 'a' occupies a subject position can be analysed away or paraphrased so that 'a' does not occur.[2]

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[1] The converse thesis, that what exists is consistent, which is usually and rightly accepted, gets repudiated in various paraconsistent theories, e.g. that of Priest 78 where the Russell class, $\{x: x \notin x\}$, exists though it has inconsistent properties.

[2] A corollary is that the methodology of much recent work on universals, e.g. that of Armstrong 78, is quite unsound.

ad III. Key to remaining criteria.

A. Holistic criteria, other than spatio-temporal ones, which (try to) characterise existence in terms of some totality, e.g. true statements, the one true theory, the actual world. GROUP 0

A*. Other criteria, which typically try to characterise existence directly in terms of distinctive features of items that exist, including spatio-temporal criteria.

- B. Spatio-temporal criteria GROUP 1
- B*. Criteria which are not dependent on spatio-temporal relations
  - C. Other relational criteria.
    - D. With intensional relations, such as those of perception. GROUP 2
    - D*. With extensional relations.
      - E. Those based on causal type relations. GROUP 3
      - E*. Those without causal base. GROUP 4
  - C*. Completeness and determinacy criteria.
    - F. Full determinacy criteria. GROUP 5
    - F*. Qualified determinacy criteria. GROUP 6

Although the criteria of the different groups are different, several of the criteria may, after some refinement, be amalgamated; in short, as we shall see upon considering the groups in more detail, a qualified synthesis of criteria can be effected.

§2. *GROUP 0. Holistic criteria.* These criteria try to characterise what it is to exist, or to be an existent or an entity, in terms of some whole or totality - such as the Physical World, the Universe, The One, or Reality - $\underline{\underline{G}}$. They take the form

OG. xE iff $xR\underline{\underline{G}}$,

where R is a relation between x and $\underline{\underline{G}}$ such as the relation of being a part of or a component of or having a place in or being in (or even partaking of or participating in). Such accounts, which perhaps go back to Parmenides, and certainly go back to Aristotle, are to be found in modern nominalism and empiricism. Thus, for example, it is a theorem of mereology (Lesniewski's formalised nominalism), and of the allegedly isomorphic calculus of individuals (Goodman's logical theory in 77), that

$$xE \text{ iff } x < \underline{\underline{G}}.$$

(How trivial the theorem is depends upon the way items are defined: e.g. if $\underline{\underline{G}}$ is defined as the mereological class, or aggregate or sum, of all entities, the proof is short.) Representative of the holistic approach are the following two accounts:-

01. To exist is to be any fragment, part or real constituent of the world (Munitz 74, e.g. p.170);

02. To exist is to have a place in the domain of reality (OED; sense 1);[1] i.e. in symbols of world semantics xE iff $x \in d(\underline{\underline{G}})$, which, when generalised to arbitrary models, is displayed by the pure semantical rule: $I(\check{x}E, \underline{\underline{G}}) = 1$ iff $x \in d(\underline{\underline{G}})$.

A first problem with such criteria is that they are circular in a rather conspicuous way and accordingly, though correct, somewhat trivial. For example, Munitz uses

> the expression 'The World' to mean 'The individual whole (or collective class) whose parts are all existents whatsoever' (74, p.141),

and the OED explains reality in terms of 'what is real' or 'has real existence' and 'real', in this sense, in terms of 'exists'; so that accounts 01 and 02 reduce to the platitude

03. To exist is to be part of [an element of] the sum of [the class of] what exists.

And, this, though true enough, is very little help on its own in characterising existence; one might almost as well say that to be red is to be part of the totality of red things, to (be) f is to be among the f things. A second problem arises from the first, namely the open hospitality of such accounts: on their own they exclude nothing. Pegasus exists iff Pegasus is in the totality: no basis is given for excluding Pegasus from the totality.[2]

Various ways out of these difficulties have been tried. One way, which commonly accompanies the pretence that the (actual, empirical) World is the only world, is to try to impose further conditions on the World; another, not so very different way, is to try to elicit features which distinguish the actual world from other worlds. The pretence that the actual world is the only world - that talk of other worlds is literally impossible, or does not make sense - cannot be sustained. For alternative worlds can be envisaged and described, in very considerable detail. The pretence is motivated by the mistaken assumption that there is something deeply wrong with talk about what does not exist, such as alternative worlds. Given alternative worlds, each with their respective entity domains, the difficulty reduces, in the first place, to how to characterise the actual world, to distinguish it from other worlds, and, in the second place, how to distinguish the entity domain from the wider object domain of the distinguished world. Plainly no account of the actual world that brings out its (entity) domain as something different from the totality of what exists will do; this rules out, e.g. accounts of the actual world as an arbitrarily selected possible world, as the best of possible worlds, etc.

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[1] If 'have a place' is construed literally the dictionary definition does, however, have some bite: see criteria under group 1.

[2] Similar problems to those here observed in characterising existent arise as regards individual and particular. They arise both independently, and because nominalism typically equates individual and particular with entity.

Nor will any account suffice which does not succeed in selecting the actual world from other worlds, e.g. accounts of "the" world as a world of individuals or as a world of individuals in their relations, or of the real world as a spatiotemporal network of things or things in their relations or of the real world as what science or physics describes.[1] For, what has been evident enough all along, and recent work on the formalisation of physics has helped to bring out (especially Bressan's work), physics can describe many different spatiotemporal worlds, even perhaps the "one true" physics. Unless *individuals* is equated with *entities*, and individuals somehow build their interrelations in, the nominalistic account of the world as a world of individuals is inadequate - for the entities could be differently arranged - and presupposes what is in question, namely what is an entity. The account of the world in terms of things in their true relations avoids the first of these objections: and otherwise the situation is like that with modal semantics shortly to be considered.

Narrowing the class of worlds by imposing constraints on *worlds* - even if it so far fails to select appropriately a singleton - seems undoubtedly to be in the right direction (this much emerges from the Aristotlean theory of definition). The restrictions have as well a most important effect, that they make criteria for existence much less hospitable. One of Meinong's arguments that higher order objects such as properties do not exist illustrates the point. Meinong argued validly thus (cf. Grossmann 74, p.156):

1. If ξ exist then ξ are ingredients of the physical world.

2. Sensory qualities are not ingredients of the physical world.

3. Sensory qualities do not exist.

Similarly for propositions, objectives, and so on: no such abstractions exist. Refining an existence criterion so that it begins to *work* at the same time renders it controversial: perhaps there is an unavoidable incompatibility here, that any criterion that approaches effectiveness does so by some exclusiveness and thereby becomes controversial. These issues will reappear with subsequent groups of criteria.

An approach much favoured in classical modal logic has been to take the actual world as the class of true statements, so that to exist turns out as to be the object of a true statement. But this of course writes in the Ontological Assumption, thereby forging a direct and simple - but fundamentally mistaken - link between existence and truth. Once the Assumption is rejected the notion of the actual world acquires crucial ambiguity, *at least* as between the class of true statements - the world that is everything that is the case (world $\underline{T}$) - and the totality of existing things on the other hand (domain $d(\underline{G})$) - the worlds Wittgenstein 47 distinguished. Given the Ontological Assumption these are isomorphic so it is commonly unnecessary to make the distinction. There is already a serious problem for the semantical theory of truth, once the possibility of alternative worlds is duly acknowledged, in selecting the base world $\underline{T}$, where what holds is the case, at which truth is assessed. Even supposing that problem is surmounted,[1] the separate question, of demarcating the entity domain $e(\underline{\underline{T}})$, i.e. $d(\underline{\underline{G}})$, of $\underline{\underline{T}}$, remains. For insofar as the world is characterised as everything that is the case there will (on noneism) be very many things "in the world", - strictly, the objects of true statements - which do not exist, since nonentities can be the subject of true statements and thus become constituents of what is the case, and hence part of the world. So being in the world in this sense can give the right rdsults only if the Ontological Assumption is assumed, if truth determines existence and T determines d(G). Once the linkage of truth and existence is broken, the classical modal approach fails in removing the circularity difficulty.

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[1] Each of these assumptions as to what the world is like will lead to further nonholistic criteria for existence to be discussed in later groups, e.g. to be an individual, to be in space-time.

One might still hope to find a characteristic of the totality $d(\underline{\underline{G}})$ to be explained more readily than characteristics of the items to be explained, but the chances of this in the case of existence do not appear particularly good. It may be more fruitful to look for a direct characterisation without a detour through the totality, through Reality or whatever. Naturally if a direct characterisation can be found, one can then return and pick up holistic criteria as well, i.e. a synthesis of criteria can then be effected.

§*GROUP 1: Spatiotemporality and its variants.* According to such criteria an item exists if it has a spatiotemporal locale or a temporal location, or some such. Representative criteria of this type are

11. To exist is to have a space-time location or locus (cf. Chisholm 72, p.246; see too Bergmann's criterion, in 64, of what it is to exist in terms of localisation in space and time): Spacetime criterion.

12. To exist is to have some spatial locale now, to now occupy a spatial neighbourhood (cf. chapter 2): Basic spatial criterion.

13. An object exists iff it is in time, i.e. sometime is a time at which the object exists (cf. Russell 12, pp.155-56): Temporal (or pure time) criterion.

These criteria differ, with (roughly) $12 \subset 11 \subset 13$. The inclusion is proper; for according to 13 (at least as Russell construed it) thoughts and feelings and minds exist, but according to 11 (on the usual construal at least) thoughts and minds do not exist, and according to 11 purely future; and also purely past objects exist whereas on 12 they do not. On each point of difference 12 seems to be right - at least if the aim is to explicate the tensed verb 'exists', as distinct from 'has existed', 'will exist', 'always exists', etc.[2] Aristotle does not exist, though he did exist; my stone

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[1] The problem is explained in detail and a solution, albeit of a circularish character, proposed in 1.24 above. But the solution is hardly very helpful on the existence question. It would be like determining $d(\underline{\underline{G}})$ in terms of truths of the form 'a exists', i.e. in terms of a's for which I(a exists, $\underline{\underline{T}}$) = 1.

There are similar problems in picking out the physical world, real space, etc.

[2] It may be objected that on the ordinary spatial criteria existence emerges as nothing but a rather boring local property - and an attempt may be made to generalise the objection into an objection that whichever direction one

(Footnote continued over page.)

temple on the mountain does not (yet) exist, though maybe it will exist. For tensed existence 11 and 13 are wrong; but of course however tenses are explicated tenseless notions can be defined, e.g. sometime existence, omnitemporal existence, by appropriately quantifying t in 'exists at t'. What emerges from this, generalising 12 to time t, viz.

12t. x exists at t iff x has a spatial locale at t,

still appears (unless a rude materialism is adopted) to rule out neural objects such as thoughts. This difficulty, if it is a difficulty, could be avoided by replacing 'spatial locale' suitably, e.g. by generalising 13 to

13t. x exists at t iff x occurs (takes place, etc.) at t,

and by refusing to admit as significant such questions as 'occurs where?' which would take 13t back to 12t.

But the refusal is commonly felt to be unsatisfactory. If ξ exist such questions as 'where can they (it) be found?', 'In what place(s) do they (it) occur?' are always significant ones, and must get an answer (and reflection on the OED senses of 'exist' confirm this claim). This is one of the forces behind the endeavour to design worlds, e.g. further realms and platonic heavens, for abstractions to reside in, and the invention of such special places as minds, so that questions like 'Where are your thoughts?' can be met by 'In your mind'. It is important to observe that the main pressure to make these problem-proliferating moves is eliminated once the Ontological Assumption is abandoned. The pressure comes because we can undoubtedly make true statements about such objects as thoughts and concepts and properties, e.g. "I have been struggling all week with the concept of existence but not had one good thought on it". But the fact that these are true statements about ξ, e.g. about thoughts, such as that they are had, that the people can entertain or share the same thought or concept, does not entail that thoughts or concepts exist: to suppose that it did would be to invoke a

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[1] (Footnote continued from previous page.)

takes, the platonising direction which leads one to say that everything exists or the nonplatonising direction which leads one to say that only what is now localised in space exists, the result is of no philosophical interest, existence is a bore. What little is true and relevant about all this is that given that existence is existence now - and this appears to be the ordinary sense of 'exists' under which sometime existents such as purely past and future objects do not exist - existence is no more invariant under relativistic transformations than is the present: existence is then a local feature. Nonetheless the logical interest in what exists remains undiminished, somewhat as the philosophical interest in the present, and in tensed discourse, remains undiminished by such scientific revelation. For existence remains a complete guarantee of defensibility ((ξxxf)E ⊃ (ξxxf)f). And relativistic invariants such as sometime-existence can be had as well, for they are readily introduced definitionally.

Spatial criteria 11 and 12 stand together, either being definable in terms of the other, sometime existence by quantification and present existence by present time cross-section of sometime existence.

version of the Ontological Assumption. It is not necessary, then, to say that thoughts or concepts exist in order to allow that true statements can be made about them. And there is a converging group of reasons for saying that such objects do not exist, one of which is the linkage of existence with place and the advantages of avoiding the problems that such curious places as minds and heavens can engender for philosophical theories. Other reasons from the nexus will emerge as subsequent criteria for what exists are considered, e.g. issues concerning physical action on thoughts and concepts, and the determinacy of thoughts and concepts. Criterion 13 can accordingly be dismissed.

Spatial criteria for existence have become debatable, not so much because they exclude thoughts from the honorific category of existents (unless we desperately assign thoughts some locations, such as in various brains), but because they rule out abstractions, and empiricists of various persuasions have come to realise that without the language of abstractions too much of modern science is in serious doubt. Again the Ontological Assumption has figured: without it it can simply be said that in a language of science true statements can be made about abstractions without abstractions existing. As with thoughts and minds, so with abstractions, there are arguments from other existence tests and criteria to their nonexistence (arguments to nonexistence must always go back, at least implicitly to such criteria). For instance, it is evident that not all properties and not all abstract sets can exist since some are inconsistent or paradoxical, but the consistency test (at best a necessary condition for existence) does not rule out all abstractions, though perhaps (for all we know) it rules out some that feature in mathematics or science. What spatial criteria for existence do however are to write off all abstractions as nonexistent. This is not quite immediate for various attempts to reduce abstractions to particulars have to be disqualified, e.g. Russell's onetime proposal that attributes be supplanted by collections of their instances (inadequate because actual instances are insufficient for dispositional, counterfactual and causal roles of attributes, and because not enough attributes are thereby supplied to guarantee classical analysis), and modern suggestions that some abstract sets coincide with aggregates of their individual members (inadequate because aggregates have different properties from abstractions, e.g. the aggregate membership-part relation is transitive, but set membership is not).
Given the failure of such reductions,

1. Abstractions do not have spatial locales.

But, by the spatial criteria,

2. Objects exist only if they have a spatial locale.

Therefore,

3. Abstractions do not exist.

The argument exactly parallels Meinong's argument for the nonexistence of higher order objects.[1] And of course the arguments can be connected, by connecting the criteria used, e.g. as follows:-

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[1] The main case for the nonexistence of abstractions is much elaborated in the material on universals, namely there are no good reasons for saying they do exist and reasons for saying that they do not; see 8.9, and for a fuller discussion 9.9.

> an object x has a place in the domain of reality (with the OED 'place' now taken literally) iff x now has a spatial locale, i.e. iff x is an ingredient of the physical world.

But these connections also serve to remind us that the account, pleasant though it is in treatment of abstractions and indeed of nonparticulars generally, encounters difficulties which transfer over from difficulties for group 0 criteria. And there are other problems as well.

A first problem is that of the definiteness use of such terms as 'location' 'locale', etc. tends to suggest. Consider criteria 11 (the criteria for sometime-existence). The location mentioned obviously need not by *completely determinate*, that is, such that for any point in space and time one can say definitely whether or not the item occupies it. Indeed it is doubtful that even the *relatively* spatiotemporally determined items such as furniture that philosophers usually consider could meet such a condition, especially given the temporal indeterminacy which arises as a result of problems about identity over time; but it is plain that many natural items which certainly exist, such as forests, lakes, clouds, and waves, do not meet it. What is intended then is that there should be some location in space and time, the item must occupy some spatiotemporal location, *some neighbourhood* (in the topological sense) even if it cannot be specified completely determinately. Similar points apply in the case of microphysical particles.

Here a second problem arises however. The criterion must be qualified to 'occupies a position in actual (or real) space and time'. For fictional items for example may occupy a position in fictional space-time, for example, Sherlock Holmes lived in Baker Street# (the fictional Baker Street that is, not the real Baker Street), geometrical objects may occupy positions in high-dimensional spaces, and visions and illusions and hallucinations, e.g. mirages or after-images, may occupy positions in perceived space and time (may be 'presented in space and time' in Kant's terminology). Such items are not entirely located in real space and time, so that if independent checks are conducted to locate the mirage, it is found not to be there. Thus perceived space and time, or fictional space and time, must be distinguished from real space and time, and it is plainly occupation of a position in the latter which must be used to characterise existence. The qualification 'real' is therefore essential, but its inclusion seems to make the criterion uncommendably circular. For what is real space and time but *existing* space and time,[1] the spatiotemporal coordinates for the existing world, which those things which exist occupy? The spatiotemporal criterion seems then to be of limited value as a useful limiting condition on existence.

In addition to having a strong favour of cicularity, the spatiotemporal criterion may appear to be unduly narrow and to wipe out many things which in any ordinary sense of 'exists' are taken to exist, particularly certain structured groupings of spatiotemporal individuals such as corporations, nations, universities and armies.[2] And while it might be pleasant to resolve the problems created by corporate domination by having such things not exist, we should also wipe out communities, ecosystems, associations and other organisations as not existing, in short structured groupings of individuals which have a spatiotemporal location. But in the ordinary sense of 'exist' some such structured groupings surely do exist, have existed at some times, and cease to exist at others. Some nations, armies, communities and ecosystems exist in contrast to others which do not, have never existed or no longer exist. The East India Company for example did exist, but no longer does; the Rio Tinto Zinc Corporation exists, whereas certain fictional companies employed by con-men do not. It seems that in the ordinary sense of existing some such structured groupings must be allowed to exist and others not. There are, however, problems about the assignment of a specific spatiotemporal location to structured groupings or complexes. At which particular point in space and time does one find a corporation, at its headquarters, its branches, its mining location, its place of incorporation or registration (which may be Liberia)? Clearly such complexes can operate in space-time and physically affect the actual world, e.g. through the individuals these objects are partly made up from. But it is often - not always - difficult to see them located at a point at particular places in space; they may have multiple locations and the boundaries of their regions are often vague.[1] Furthermore the biggest of these structural groupings, the actual world (in the sense of the totality of things that exist in their relations) does not have a spatiotemporal location: on some relational accounts it is space at a given time.[2]

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[1] In general 'real f' and 'existing f' cannot be equated, neither implying the other; but in certain contexts the equation is permissible.

[2] Complexes in Meinong's sense. These complexes, though usually composed of individuals, are also particulars.

Even if in some of these cases there is no difficulty in assigning a spatiotemporal location - e.g. the army can be sent to Ireland, an ecosystem can be found in a particular region, and a company with headquarters and all operations in a particular city might be said to be in that city (e.g. a Detroit company) - it is still the case that such complexes frequently raise a host of problems concerning locations and the possession of a particular spatiotemporal location which do not seem to be reflected in the notion of existence itself. So, for instance, the question as to where the Rio Tinto Zinc Corporation is located usually involves a decision, an element of arbitrariness or stipulation; but there is no such arbitrariness or stipulation concerning whether it exists. Possession of a particular spatial or spatiotemporal location is not, it begins to seem, of the essence of existence: for if the account did capture the notion, arbitrariness or indeterminacy about location should show up in parallel features of existence.

However the existence of complexes such as corporations is not as clearcut as these considerations suppose; such objects as corporations, trusts, partnerships, and even universities, are sometimes reckoned legal fictions. They have it is said 'an existence only in law' - which is to say that they do not exist but that they have properties conferred by legal institutions, such as charters, acts, etc. Thus for example Chief Justice Marshall in the Dartmouth College Case (cited in P. Goodman 66, 2nd page of chapter 2):

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[1] Nor is there a clear line between cases where there is a clear location and cases where there is not.

[2] Isolated exceptions of this sort are however easily taken care of in a general account.

> A corporation is an artificial thing, invisible, intangible, and existing only in contemplation of Law. Being the mere creature of Law, it possesses only those properties which the charter of its creation confers upon it.

If indeed corporations did possess only such properties they would be quite analogous to fictional fictions whose properties derive from their source book (and also to Parson's objects). But the truth is that corporations possess quite a range of other properties. Though they do operate, to varying extents, within their charters, they carry out many operations not specified or detailed within their charters, e.g. placing advertisements, lobbying and bribing officials, minimizing their taxation, etc; and thus they have many properties not simply conferred by their charters. They are not "mere creatures of law", "existing only in the contemplation of Law". As for their artificiality and so on, existing things[1] can have these properties. A newly synthesized gas may be artificial in the sense that it does not occur freely or at all in nature (most of modern houses and their contents are artificial in a good sense) and it may be both invisible and intangible - though of course it can be detected in other ways: but so then (if in different ways) can a corporation and its power. A gas is a certain physically constituted and bonded collection of its molecules, a corporation is a certain legally constituted and related collection of its members. Are the differences enough to count one sort, gases, as existent, and the other sort as not existing?

It seems likely moreover that explicit broadening of spatiotemporal location criteria would enable most of these difficulties to be avoided. For example, to expand criterion 12, take existence to be either possessing or occurring in or operating in - or more comprehensively functioning in - particular (spatial) neighbourhoods. Then even if we cannot easily say where RTZ is we can certainly say that it operates in Chile, and there is no decision problem about that. The solving of some problems leads to others: it has to be explained, for example, that being instantiated in neighbourhoods is not a sort of occurring in neighbourhoods, else the criterion designed to admit complexes, which are particulars, admits what is very different, universals such as properties. Then too it is not difficult to see how the characterisation could be widened to admit properties, and the question 'Why not do so?' is raised, along with underlying worries as to the apparent arbitrariness in deciding - what ought to be one of the hardest of properties - what exists, or what counts as existing. But most important, the broadening of criterion 12 does not get around the problem of circularity, the need to appeal to real space.

Another criterion of group 1, which initially looks promising, but fails to escape the circularity difficulties is the Kant-Moore suggestion: to exist is to be met with (encountered) in space. The criterion is however incomplete; we want to ask: Met with by whom, and how, in what space? Presumably we receive the answer that it must be met with by an entity in real spaces. For otherwise Dr. Watson would satisfy the criterion since he is met with by a fictional character, Sherlock Holmes, in fictional space. And similarly a host of other nonentities would be met with under the criterion, e.g. regular 23 dimensional figures are to be met with in 23 dimensional space. Once the requisite qualifications are introduced the sort of circularity that infects other spatio-temporal accounts reappears. The criterion not only appeals to an entity, but also to the notion of real or existing space. The criterion seems in fact to combine the simple spatial criterion with the perhaps different criterion of being suitably related to an entity, and thereby leads on to relational criteria.

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[1] With gases and suchlike the word "object" becomes a little strained: most words have their limitations.

The logical structure of many accounts of what it is to exist will be becoming evident by now: the general form emerging is as follows:

RE. xE iff $xR\rho$,

where ρ is some paradigm existent, such as as Reality, the World, Space on realist accounts, and as the subject, the perceiver, oneself, on more idealist accounts, and R is a specific relation or type of relation. The existents are then the things suitably related to a (or some) paradigm existents. Accounts of this type may well be called relational accounts, in contrast to cluster-of-property accounts which endeavour to explain existence in terms of the possession of certain cluster of properties possessed. Both sorts of accounts have famous logical representatives, identity in the second case and the definitions of cardinal numbers in the first. Consider the way the number 1 may be defined, namely by abstraction from the predicate 'is one', symbolised 1, where

$x1$ iff x corresponds 1-1 to ρ_1

with ρ_1 some paradigm unit set, e.g. $\{\Lambda\}$. This logistic definition of cardinals is indeed an attractive model to try to emulate in the case of existence, but there are again some hitches. Firstly, there is the contingency of paradigm existents,[1] a problem, if it is a problem, that is rather more severe with idealist "paradigms", such as the Self than with paradigms such as Reality or Space. For it can be argued (if mistakenly) that if Reality doesn't exist nothing does, i.e. Reality is genuinely a paradigm.[2] Secondly, in the logistic definition the paradigm can be independently defined. The trouble, as we have seen in groups 1 and 2 is that independent characterisation of the paradigm, which makes no appeal to the notion being defined, is problematic. (Of course it has been contended that the logistic account has similar faults, but it is doubtful that the criticism has been sustained.) Thirdly, there are problems in the existence definition with the relation. No simple analogue of 1-1 correspondence, it may be insinuated, has been found, or is likely to be found. But such a relation is just what we have been considering, namely the determinable relation of being spatially related to (with such determinates falling under it as being in such and such a linkage to, direction from, distance from, being in the neighbourhood of, etc.). Perhaps the logistic example is not being strictly adhered to, since spatial relations (if distinct from relations with such and such logically characterisable properties) do not appear definable in purely logical terms, e.g. in the framework of PM, perhaps extended to include geometry. But the logistic example, though illuminating, can be a hindrance if insisted upon in a rigid way, in particular in a way does not sanction different paradigms. The paradigms for existence are not invariants which necessarily have their paradigm-making feature: they are local objects and, since nothing necessarily exists, they have their key feature contingently. As paradigms there is thus a clear choice, namely ostensively-indicable local entities. To exist is to occur in their neighbourhood, in the spatial network they generate, or, more briefly, to be spatially related to them.

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[1] If there were necessary existents, e.g. God, this sort of problem would be removed. But plainly the problem can't be removed by appeal to necessary existents except in a question-begging way.

[2] A Cartesian might object that on the contrary there could be no better paradigm than oneself.

The account has the great virtue that it yields the Brentano requirement, that entities cannot stand in an entire physical relation to nonentities, as a corollary. Suppose, otherwise, that an entity a and a nonentity b stood in an entire physical relation. Then they would be spatially (or spatio-temporally and so spatially) related. Thus, since b is spatially related to a which is spatially related to the paradigm, b is so related to the paradigms, by transitivity of spatially relates, i.e. b exists. Briefly, if something relates spatially to an object in the spatio(temporal) network, it too so relates.

The next groups all involve attempts to vary the paradigms and relations of relational-style accounts; the order is from idealistic accounts to progressively more realistic accounts.

§4. *GROUP 2: Intensional criteria:* The most notorious example of such a criterion is encapsulated in the phenomenalistic slogan

21. Esse est percipi, to exist is to be perceived.

The defects of the criterion are well-enough known, e.g. prima facie it fails to accommodate the continued existence of what is in fact unperceived, or the existence of perceivers themselves, or of what is for technical reasons not open to perception at all. It is not too much better than such slogans as, to exist is to have enemies, to exist is to be fallible, etc. Initial improvements on the Berkeleyan criterion are not difficult to devise; for instance

22. To exist is to be perceivable (or observable, etc.).

But how the able is to be spelt out, that is the familiar question. For perceivable is like verifiable as in the verification criterion. 'Perceivable' does not mean 'can (logically, or technically) be perceived' but rather 'capable of being perceived', a dispositional notion which is in itself a source of difficulty for some who would adopt such a criterion. The criterion is incomplete, and filling the gap, answering 'By whom or what?', reveals that the criterion is also circular. For if Dr. Watson gets in among perceivers then Sherlock Holmes exists. But if only existing perceivers count, then the account - now truly of relational form - presupposes a prior account, if not of existents, at least of existing perceivers, or of some existing perceivers (since it is presumably the capacity of those perceivers that are best at perceiving that matters). But what exists should not have to depend on the, accidental, capacities of existing perceivers. Maybe this can be avoided by appeal to some ideal perceiver: but how much is it capable of perceiving? Is it just what exists? The circle is complete. The need for and ideal perceiver, and the ensuing circularity, comes out once it is realised how narrow the criteria which appeal to existing perceivers are otherwise even as compared to the pure spatial criterion. Though criterion 22 does not rule out material objects not in fact perceived, it does seem to exclude

a) unperceivable physical objects such as micro-particles,
b) complexes such as corporations, and also
c) mental objects, and
d) abstractions.

Even if an ideal observer can aid in passing a), it cannot help in other cases since it is nonsignificant to speak of seeing, touching or otherwise perceiving abstractions, corporations, or the like (except in a figurative sense such as Plato's 'seeing the forms'.) On noneist perceptions the perception criteria are not only circular and perhaps too narrow; they are also too wide, since one can sometimes perceive what does not exist, past items, hallucinatory objects, etc. (see chapter 8).

A similar objection can be made to other criteria for existing which appeal to intensional relations to entities, namely that intensional relations (pure ones at least) enable nonentities to truly relate to entities. Suppose, for instance, someone foolishly suggested that whatever can be thought of exists, all objects of thought exist. The refutation, adapted from Brentano, is simply: one can as readily think of a unicorn as a bicycle. More deceptive than the relation of thinking is that of having. There is a strong temptation among those who use discourse as existence-committing (reference theorists) to infer from x has y, especially where x exists, y exists. The inference is fallacious, as appeal to earlier criteria should reveal. "St. L has a vision (dream)" does not entail visions (dreams) exist; that M has a thought about Pegasus or has a mind does not entail that that thought or M's mind exists: that grass has the property of browning off under frost does not entail that the property, or properties, exist; and so on. Being had by an entity does not guarantee existence; nor does having an entity, e.g. fictional characters have creators. It may be suggested that the trouble is that 'has', at least in these constructions, is not transparent and so not extensional. But there is a closely related predicate 'in fact has' which is, without doubt, transparent but which yields similar results with respect to existence (cf. also 'is about'). Such predicates begin to cast doubt on the idea that for relational existence criteria it is enough to avoid intensional relations. For is it that 'has' is intensional? Which brings us to division D*.

§5. *GROUPS 3 and 4, and the Brentano principle improved.* One existence criterion that can be extracted from Brentano's criterion for the mental in terms of intensional inexistence is this:

D1. x exists iff x has an extensional relation to an entity[1],

i.e. the basic qualification needed on RE is that relation R be extensional. The crucial objection to D1 (an objection also to Brentano's inexistence criterion) is that extensional relations can hold between entities and nonentities, one of the most conspicuous being the set membership relation, ϵ. Let a be some entity, e.g. the world if you like: then a exists, $a \epsilon \{a\}$, but the singleton $\{a\}$ does not exist. Very controversial, given the current set-theoretic religion. However the elementary counterexample can be extended, using the acknowledged extensionality of ϵ, to prove that under D1 all objects whatsoever exist.
Proof. Consider an arbitrarily selected entity a, and let w be any set of which a is a member, e.g. $\{a\}$ or some superset. Then $a \epsilon w$ provides an extensional relation to an entity, so w exists. Now w is included in the

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[1] Note that use of D1 carries no commitment to the existence of relations, since D1 only says that, for some R which is extensional and some z which exists, xRz. And D1 could be rephrased nominalistically in terms of an extensional predicate.

The Brentano criterion naturally suggests - and certainly has suggested to several researchers - that the sorts of relations that cannot hold between entities and nonentities are extensional relations - though the connection does rely upon an intentional/intensional equation.

universal set V of all objects whatsoever, $w \subseteq V$, for $\subseteq$ (which is definable in terms of $\in$) is an extensional relation and so all its elements exist, i.e. everything exists, including all abstractions, all mythical objects, etc. The class of counterexamples to D1 is far larger than mere set-theoretic relations. For many, apparently extensional, *comparisons* can be truly made between entities and nonentities. For example, the Irish giant Finn was bigger than Jack Smart, Sherlock Holmes was smarter than, and has a different occupation from, Walt Disney.

Allowing arbitrary extensional relations as in D1 is therefore too permissive, the class of relations has to be further narrowed. With causal theories at present exponentiating in philosophy, why not a causal theory of existence? This suggests

31. x exists iff x bears a (direct) causal relation to an entity;

even, if you like, whatever exists is linked by a causal chain back to a (or *the*) primeval entity. There are of course temporal difficulties for 31: x which caused y no longer exists, z which y causes does not yet exist. An attempt may be made to circumvent these by first using 31 to define *sometime-exist*, and then defining *exists* in terms of sometime-exists, e.g. as: x exists iff x sometime-exists and x is contemporary (i.e., for local x, is simultaneous with earth now, or in Prior-like terms, for some ϕ it is now true that x ϕs). What sometime-exist then are elements of the world's causal nexus, but this being so the difficulties of earlier proposals seem to recur. Other worlds may also have causal networks: Holmes may cause an explosion or a death, James Bond certainly did. But once again these difficulties do not, in fact recur, because now relation to *an entity* has been incorporated into the semi-circular account (the difficulties were eventually avoided in a similar way with the spatial criterion). Only the trouble is that such criteria no longer characterise existence independently of existents.

The causal criterion 31 is a much more generous one than the spatial and perceivability criteria, and not just because it is geared to catching sometime-existence rather than present existence; indeed, without qualifications (like those set out below), it is far too generous. Consider chains like: The Duke caused Joe's arrival, Joe's arrival caused a revision of plans. The thought of revenge caused a revision of plans. Joe's arrival caused Joe's suffering. Adversity caused Joe's suffering. Stinginess caused Joe's suffering. Stinginess caused unhappiness. Incredulity caused unhappiness. Obesity causes death. Nobody caused Joe's arrival. The proposition that ... caused a revision of plans, etc. etc. What exists then includes not only events and states, but thoughts, revisions and problems, pains and deaths, properties and attributes (including, it seems , uninstantiated ones) and propositions, and so forth.

Similar or worse results ensue upon replacing 'cause' by other predicates of a like caste e.g. 'act upon', 'influence'. Qualification of the predicates by 'physical' improves the situation, but leaves another problematic term to try to explain. Consider 'physically act upon'. Unless universal gravitation or a similar universal force is invoked, it would seem that some entities could be outside the physical influence of others: certainly if the world is segmentalised into isolated sections the criterion - at least under an obvious construal - fails, and this shows that if such a criterion succeeds it is a purely contingent matter, depending on the structure of the physical universe.[1] Nor is a shift to 'capable of physical action upon' an entirely acceptable repair: apart from the intensional shift, physical exclusions may render one object incapable of influencing certain other objects. The intended construal of the admittedly ambiguous 31 and its variants is however not that relating x to some fixed or given entity but rather

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[1] It might be argued that there is a connected unsatisfactoriness in the causal criterion for sometime-existence if alternative futures are not excluded.

(footnote continued on next page)

> x exists iff, for some paradigm entity y, x is
> causally related to (physically interacts with) y.

The reformulation is only one step in improving upon the causal account.

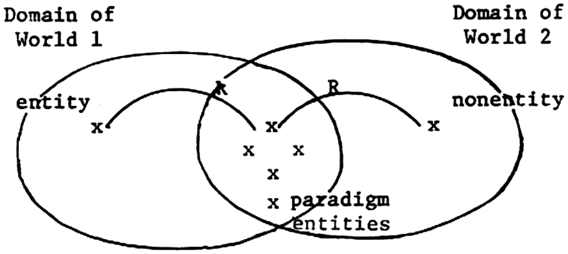
The next qualification in repairing the causal account would be to particulars; in world-relativised form 31 becomes

32a. x sometime-exists at world a iff x is a particular which is causally related in a to some paradigm entity of a.

The assumptions are that causal networks are world-restricted and, what is less evident, that every entity of a world is in the network (i.e. system of causal connections) of some paradigm entity. The latter depends on an appropriate choice of paradigms (perhaps not such a straightforward matter, if the physical universe is ill-behaved). It is contingent that there exist paradigms, but the biconditional of the criterion is not thereby rendered a contingent connection.

A further qualification - unless mental particulars are to be included - should be to physical or spatial particulars. The account is beginning to converge with the spatio-temporal; but only beginning to. For again, without the postulation of universal forces, two objects in a spatial or spatio-temporal neighbourhood or network may not physically interact. A repair in terms of 'capable of physical interaction' does further narrow the gap, but does not close it unless - what does seem likely enough, and can be linguistically enforced - every object in the neighbourhood of some paradigm entity is capable of physical interaction with some (perhaps other) paradigm entity. At about this stage it may seem worthwhile enforcing the convergence.

Criteria of group 4 also take us back in part over ground we have already traversed. For prominent among criteria of this group are those that involve spatial-type relations to entities, e.g. being in some spatial direction at some distance from a paradigm entity. For such criteria to succeed a qualified Brentano principle has to hold; for if different worlds can overlap on the paradigm entities, one relating to entities by given allegedly-entity-preserving relations, and the other to nonentities such criteria fail. The (rejected) picture is the following:-



(footnote [1] continued from previous page)
The causal network branches, e.g. through some contingency or randomness into a nonreal future. Without a strong deterministic assumption, then, the causal network account is widely astray.

The short reply is that if a belongs to an alternative future that does not eventuate then a is not caused by what does happen.

Evidently then the relation R, whatever it is, must be such that it never relates entities to nonentities. Whether spatial-type relations can fulfil the role turns then on the account given of fictions generally, including theoretical items. If, for example, "Holmes lived in Baker St." were entirely true of (real) Baker St., then Holmes would at some times be at some distance from the paradigms and conversely. But any theory of fictions including relations of this sort involves seemingly insuperable difficulties (fictional paradoxes and the like, as explained in chapter 7); and is best avoided. And so it seems that a Brentano principle can be accepted for certain spatial-type relations, and also for such favoured contiguous action relations as kicking.

Let us (for want of a better terminology) call such relations, physical-world-constrained relations, for short, physical relations,[1] or, for reasons that will become apparent, spatially-grounded relations. The resulting Brentano principle is accordingly

BTP. x exists iff x has a(n entire) physical relation to an entity.

Yes, BTP involves a primitive 'physical' which (while not too difficult to explain semantically) is undefinable in terms of the logical apparatus so far introduced, at least without appeal to the notion whose explication is sought, existence. Apart from this obvious problem, a residual problem is as to whether BTP concerns present existence or sometime-existence; and really this depends on how generously 'physical' is construed. One way to cut through the main problem is to specialise physical relations, to a particular (paradigmatic) one, most obviously, in the light of previous investigations, to a spatial relation. For if a physically acts on b then a is spatially related to b; spatial relations in the relevant sense (as distinct e.g., from spatial comparisons) seem to be basic. Physical relations are spatially grounded. In particular, if it is literally true that b is at some distance from a and a exists, then b exists. Hence at least half of the biconditional,

41. x exists iff x is (now) at some (approximate)
distance from a paradigm entity,

is pretty uncontroversial. Of course, even if uncontroversial, it is not assumptionless: it appears to assume that a single metric can be imposed over all entities, and that none are spatially isolated in any partitioning of the universe that isolates entities from physical interaction. And the criterion may need a little refinement to accommodate micro-objects, e.g. in terms of being in some bounded region at some (perhaps zero) distance. Refinement can however be had. Consider, as a first step, 'is at some (approximate) distance from', which can be so read that no metric is supposed; for instance it is replaced by 'is in a spatial region at some remove from'. This suggests in turn an improved purely topological characterisation:

BTPS. x exists iff (it is entirely true that) some spatial
neighbourhood (now) includes both x and some paradigm entity,

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[1] The abbreviated term 'physical relation' used in earlier chapters, is rather misleading, since many relations ordinarily counted as physical (and of physics) are dispositional, and so intensional.

Physically related to differs, almost needless to say, from physically interacts with; the first includes the second. But not necessarily vice versa. Again replacement of physical interaction by capability of physical interaction narrows the gap almost to vanishing point.

Note that it is often taken for granted in these contexts that the physical relations concerned are entire.

i.e. the spatial relation in question is reduced to that of being in the one spatial neighbourhood. Nor is the account now so far removed from formalisation; for the logic of topological space may be captured in part by the introduction of an interior operator I which behaves in main respects like an S4 modal functor (cf. McKinsey 41). With the shift to the special Brentano principle, BTPS, many problems are solved. The if clause remains pretty uncontroversial; micro-objects are now accommodated, no metric is presupposed, what of topologically inaccessible parts of the physical universe? There simply are no such parts; if there is no topological connection then the unconnected parts are not part of the physical universe but belong to separate worlds.[1] If the only if clause of the special principle remains in doubt it is presumably because it is supposed that nonentities such as fictional objects can be spatially connected to entities, e.g. Holmes can live in London and walk down Baker St. No such entire relations obtain (to repeat points from chapter 7): the keeper of records of inhabitants of London would not list Holmes, the registrar of births and deaths would have no record of him, the watching eye on Baker St. would never discern him, nor would his feet leave any marks or stir any dust.

Criterion BTPS extends straightforwardly to a criterion for existence at world a. The existent objects of each world form a spatial network, part at least of a topological space. Just as nothing prevents an object belonging to different topological spaces, so nothing stops one entity from existing in two different worlds. The prohibitions on spatially-grounded relations apply not merely with respect to the real world T, but also as regards other worlds. For example, Mr. Pickwick, unlike Watson, cannot encounter, bump into, or be in the same neighbourhood as Holmes. (Of course a new Hollywood movie might be billed as including both Holmes and Pickwick.) The failure of such spatial inter-relations does not preclude other physical properties, such as size, mass, etc., and comparisons based on these, e.g. Pickwick was undoubtedly fatter than Holmes since Pickwick was portly while Holmes was spare.

Given BTPS and an appropriate definition of 'spatially-grounded' (i.e. 'physical' in this sense), BTP can be derived. Let a relation be spatially-grounded if it implies a topological connection. Contiguous action relations such as kicking, colliding, hanging, and so on, do. Since implication is reflexive and the spatial connection relation of BTPS is thus spatially grounded, the if clause of BTP follows. Conversely suppose that for some spatially grounded relation R, x R-relates to a paradigm entity. Then x is topologically connected to the paradigm, and so by BTPS, x exists.

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[1] Here lies part of the reason why that view of possible worlds that Kripke claims (71, p.147; also 72, p.267 ff.) makes D. Lewis's view 'most reasonable', that of possible worlds like 'a foreign country or distant planet way out there', is so unsatisfactory. For then all the inhabitants of possible worlds, including those we know do not exist such as Sherlock Holmes, do exist. And since these worlds can be sighted, so Kripke supposes, through powerful enough telescopes, physical relations such as radio-telephone hookups can in principle be made with the inhabitants.

Even if some group 4 criterion is accepted the problem is not finally resolved, because of reliance on paradigm existents or (given the assumption that all entities are topologically connected) a paradigm entity.[1] It might be claimed (an idea already floated) that such reliance is inevitable. There is the idea, implicit in some of Russell's earlier writings, that the actual world is a particular that can only be pointed to, and not something selected by characterisation, especially logical characterisation. 'Exists' is, so to say (and in striking contrast to the doctrine of PM), a pure primitive; so paradigms are inevitable. But it is by no means obvious that something as fundamental as picking out elements of the actual physical world has to rely on ostensive starting points. It may be that by a Leibnitzian approach ostension can be avoided. Until such alternatives are exhausted, the limits of language - at least as regards defining 'exists' - have not been reached.

§6. *GROUP 5: Completeness and determinacy criteria.* The basic criterion of the group, from which others are obtained by modifications or explication, is the following.

51. an object exists iff it is consistent and complete in all respects. One important restriction, already remarked, is to extensional properties; for an item's existence is not upset by the incompleteness or inconsistency of some creature's attitudes towards it. An important explication is of object consistency and completeness through the coincidence of sentence and predicate or, in the material mode, of (propositional and property) negation. So results the formally attractive:

52. x exists iff, for every extensional f, x~f iff ~xf, the criteria adopted in 1.19 and temporally relativised in 2. These are variants on 52 designed to get the modal features of existence right (e.g. that it is logically necessary that inconsistent items do not exist but always a contingent matter that what exists does exist), but rather than look at these somewhat problematic variations let us reconsider the basic criterion, its rationale and its adequacy.

Determinacy criteria emerge historically from the work of Meinong and of Russell (as explained in 1.19). According to Meinong, objects which exist are determinate in every respect (see Mög, p. 169, and the discussion in Findlay 63, p. 156 and p. 166); furthermore indeterminacy is seen as reflected in the failure of excluded middle (in predicate form). Strictly then, Meinong furnishes us with only a one way conditional.

5M. if an object exists then it is fully determinate.[2]

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[1] The paradigm may, especially if ostensively defined, be given an egocentric bias, and so combined with group 2 criteria), e.g. it may be oneself, one's neighbourhood, etc. The contingency of all existence becomes thus manifest (cf. §7).

[2] On Meinong's theory the converse implication fails because higher order objects which obtain but do not exist are also fully determinate. But such objects only appear determinate, so it can be argued, because features that would cause indeterminacy are written off as not significantly applicable.

Note that cases of significance failure also produce, through T-covered statements a sort of indeterminacy. Consider a predicate f, such as 'weighs

(footnote continued on next page)

Both halves of the biconditional 52 may be found however in PM *14.32 (at least in the case of definitely described objects, and every object can be definitely described, at worst by connections such as a = (ιx) (x = a), i.e. PM* 14.2. Determinacy criteria are not supported merely on historical grounds: these grounds promise a case, which can be made out. Considerable support for determinacy criteria has already been documented, notably in chapter 1 (§19) where 52 is defended as a provisional account of existence.

Like other criteria for existence, determinacy criteria have, despite their appeal, their drawbacks, as already observed in defending 52. The first problem with determinacy criteria is that many objects that exist are not fully determinate. It is not necessary to go as far afield as quantum indeterminacy of micro-particles to find cases of indeterminacy. Natural objects such as clouds and waves and gases, forests and mountain ranges and waterfalls, are indeterminate in various respects, especially as regards their boundaries, lengths, and numbers of components. Ask yourself:- Where does the forest end? How many peaks are in the range? How many clouds are in the sky? Is this the next wave? Etc. (Compare again chapter 3). The indeterminacy features of quanta certainly appear to fit neatly within the framework of a theory - such as a noneism can be - which allows for and takes due account of indeterminacy. To see the existing world as completely determinate then goes against not only the facts of language but the apparent facts of physics.

The indeterminacy of entities is not exactly news; it was pointed out by Wittgenstein 53, and amplified by Wisdom 52 and 53, who both saw such indeterminacy, quite rightly, as showing the inadequacy of simple empiricist or reference style theories of truth (and a meaning), according to which all the properties of an item are simply properties of a reference and are all determined by simply examining referents, all are simply given (empirically).[1] Some properties of an entity are not simple observationally determinable features, are not determined just by the reference, but depend - if indeterminacy is to be reduced - upon decisions being made about whether a given property applies or not, for example the question of where exactly the forest ends. No matter how many observations you make of the forest, how many more things you find out about exactly how the trees and cleared land stand in relation to one another, what the distance is between them,

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(footnote[2] continued from previous page)

10 kilograms', which is not significant of numbers, e.g. of 7. Then, where '-' reads 'it is not true that', i.e. '~T', both -7f and -~7f. That is logical indeterminacy appears in higher order objects. However the same sort of non-significance-produced indeterminacy affects bottom order objects, whether existing or not. Such "indeterminacy" has no ill-effect on determinacy accounts of existence, for -...f and -~...f do not yield matching predicates of the form g and ~g.

[1] Predictably Quine has announced (in 75) that indeterminacy is no problem: really, or seen properly, there is no indeterminacy (or indeterminacy is an epistemic matter, not a genuine logical or ontological problem). He is bound to take this line. Otherwise the Reference Theory is in deep trouble: entities lack sharp identity criteria, so there are entities without (full) identity, etc. Moreover he has no logical apparatus for representing indeterminacy satisfactorily.

etc., that itself will not tell you where the forest ends, for an element of decision is involved. And even if you decide on this feature, there will always, according to Wittgenstein and Wisdom, be another such property of the item which has not been decided. It is quite unnecessary however to insist on indeterminacy everywhere (in a way that aids scepticism) to do damage to 52. Limited indeterminacy in some entities does that. Because some entities are indeterminate in some respects it does not follow that all are in some (or all) respects. That was not Wittgenstein's way, which leads towards linguistic conventionalism. The applicability of description was seen by Wittgenstein as governed by rules (these he saw as linguistic conventions but they might alternatively, for the purpose of the argument, and better, be seen as semantical rules); but there cannot be rules to cover all contingencies or situations (as is clearly recognised in any system of legal rules), so that indeterminacy arising from this source is not an occasional but an inevitable feature; no matter how many decisions are made there will always, so it was claimed, be further indeterminacy arising from areas where the rules or their applications have not been decided, and this applies to entities as well as nonenties.

The question is, decision about what? Wittgenstein and Wisdom thought that these were decisions about language, about words or about what to say. But this does not seem right - we are after all, not in doubt about the meaning of 'where', 'the', 'forest' and 'ends', and it is not the meanings of these expressions which we are deciding but where the forest ends. (Of course some decision issues may be purely linguistic - the point is that not all are.) If such issues were only linguistic, only about the use of words, they would be very much more arbitrary and conventional than they appear to be. It is how to locate the boundary properly, we have to decide, where the forest ends, not meanings of words.[1] So although they correctly emphasised that these indeterminate features of entities meant that the empiricist and referential accounts of entities as having their properties given and referentially determinate, and in base cases simply determinable by observation, must be wrong, they in fact tended to replace the account by a nominalistic or conventionalistic one which saw the further elements as linguistic. Their criticism and rejection of the Reference Theory and associated empiricism was not then sufficiently far-reaching. What is shown by the indeterminacy (i.e. incompleteness in certain respects) of certain entities is that reference alone does not determine even all the extensional properties - some still remain to be decided or resolved or, as in quanta cases, left unresolved. That is, some extensional properties of entities are not settled referentially, or even through admitted referential adjuncts, such as linguistic convention.

How can such decision gaps arise, on a nonreferential, nonlinguistic account? What indeterminacy, as well as the applicability of intensional properties to entities, shows is not that some properties are essentially linguistic, but that there are nonreferential ways of talking and making true claims about entities, items in the actual empirical world, $\underline{\underline{G}}$. Naturally indeterminacy is by no means confined to entities or to the actual empirical world: it is much more characteristic of nonenties. A case of indeterminacy in fiction, for example, is that where numbers of people are indeterminate; for example the old woman who lived in the shoe, the number of whose children is unspecified but presumably exceeded two but was less than 500.

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[1] The properties concerned, specified by predicates like 'contains twenty peaks', 'ends at the gate', 'will have precise position p', etc., have something in common with intensional properties, since they are typically relational properties and their correct application requires in certain cases further decision. Can such properties be treated as implicitly intensional then, and objections to 52 avoided in that way? No, no world shift is called for in their semantic assessment; nor are the requisite indicators of intensionality operative, e.g. there are no intensional connectives to be extracted by linguistic transformations.

The sort of indeterminacy thus apparent with entities does indeed seem to be of the same type as the indeterminacy already noticed in the case of nonentities. For example, all Quine's famous complaints arising from the indeterminate features of nonentities transfer to similar indeterminacy in entities (of chapter 3). In many cases concerning entities the grounds for decision appear to be similarly arbitrary, e.g. "How many waves are there in that pond?" seems to be as little decidable in a non-arbitrary way as the celebrated question of the number of angels standing on the head of an imagined pin. The indeterminacy of the number of waves in the pond, which may be somewhere between 3 and 8 but is not determinate as to which exact number, resembles that of the number of children of the old woman. Of course the grounds of indeterminacy and the ways of resolving it may differ in the case of entities and that of nonentities. In the case of entities indeterminacy commonly arises from individuation problems, whereas in the case of nonentities not just these grounds arise, but other grounds also, for instance it simply may not be specified what the property or relation is, e.g. what colour the round square is, who the mother of Hecuba was, and there are no non-arbitrary grounds for settling the characteristic.[1] The critical point is however that the logical characteristics of such indeterminacy appear to be the same for entities as for nonenetities - it is false that n was the number of children of the old woman, just as it is false that n is the number of waves on the pond and false that it is not, for any n between 3 and 8. In certain cases then, entities will have extensional properties such that both they and their negations are false. The logical apparatus which enables us to deal with nonentities also then enables a more sensitive, flexible and satisfactory treatment of entities, one that can take account, without further complication, of the indeterminacy of features emphasized by Wisdom and Wittgenstein, and does not have to assume they are all invariably complete or determinate in every respect. Again, the payoff of a logic for nonentities then is an improved logic for entities.

The message is beginning to get through that classical logic is inadequate for reflecting the way we talk in natural language about nonentities. What is insufficiently appreciated is (as argued in the case of direct realism) that the same features which make it inadequate for the treatment of talk about nonentities also makes it inadequate for talking about the actual world and about entities. The point has already been argued as regards classical logic's treatment of intensionality, which makes it inadequate for the commonsense treatment of observation and perception concerning entities. Another area in which classical logic's impoverishment prevents it giving an adequate treatment of entities is that of indeterminacy. For it is not just in the area of nonentities that indeterminacy occurs - entities are also sometimes indeterminate in some of their properties.

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[1] There may be important identity differences also in case of nonentities that do not change over time. The forest is not a new forest when its boundary is (further) determined, the electron not a new electron when its position and momentum are subsequently precisely measured. For an item can change over time in extensional respects, without becoming a new item at each stage. But in a static world a nonentity cannot have its extensional properties further resolved, without being superseded by a different nonentity with different properties.

Recognising the indeterminacy of entities not only raises various problems for classical logical theory; it also causes difficulties for Meinongian orthodoxy. It is not just that existence cannot be defined in terms of determinacy, without further qualification; existence is not even a necessary condition for determinacy in the way Meinong supposed (in 5M). However, several options remain open, as regards the relation of existence and determinacy, namely:-

(1) Modify the characterisation of existence, and the thesis that no entity can be indeterminate in any (extensional) respect.

(2) Discount the case for the indeterminacy of entities.

(3) Recognise the indeterminacy of entities, but try to account for it in some other way, e.g. through classing it as a different sort of incompleteness.

(4) Make use of what remains intact in the relation 52.

Option (2), writing off the case for the indeterminacy of entities, or simply dismissing it as not of importance, might fit well into those sorts of theories that are prepared to ride roughshod over the data presented by natural language on what can be truly said - as in (con)temporarily fashionable theories - but it is at odds with a basic motivation of noneism, which is an attempt to account for this data with the minimum of reconstruction, to give the data priority, rather than to reshape it to fit in with a prior theory. Option (2) then is not a live option.

Option (3) would not ignore or discount the indeterminacy of entities, but would treat it as a different kind of indeterminacy or incompleteness, and thus not require the abandonment of complete determinacy as a necessary condition for entities. What is the case, though, for recognising a different sort of indeterminacy here? The cases appear to have similar logical features, even if indeterminacy sometimes arises in somewhat different ways, and may be resolved differently. The indeterminacy of time on the sun (Wittgenstein's example) is in principle resoluble, resulting as it does from the failure to establish a convention for temporal measurement, but until such a convention is established on acceptable grounds the logical features of assertions concerning time on the sun are similar to those concerning the baldness of the present king of France. Unless some clear difference can be shown, the proposal for isolating the indeterminacy of entities as different in kind seems ad hoc, designed to maintain the thesis of completeness of entities in the face of confounding evidence. Unless good reasons emerge for postulating a different kind of indeterminacy in terms of an important difference in logical behaviour, methodological considerations weigh in favour of treatment of the indeterminacy of entities using the same logical apparatus as that designed to treat the indeterminacy of nonentities.

Only options (1) and (4) remain. The evidence is that determinacy cannot be regarded as a necessary condition for existence, since entities as well as nonentities may be indeterminate with respect to some properties: determinacy is not - at least not without further ado - what distinguishes entities and nonentities. For can it be treated as a sufficient condition for existence? Is the converse of 5M, namely

5P. If an item is consistent and complete in all extensional respects then it exists

correct? 5P would enable option (4) to be pursued (as in §8); for it would furnish paradigm entities. Whether 5P is correct is a sensitive and difficult issue. It might seem, on first reflection, that counterexamples could be obtained by appropriate complete specification of a nonentity. For example, proceed as follows:- Assign to each extensional property ψ and its negation $\sim\psi$ a (real) number; then employ a numerical function which determines for each numbered property whether the item has it or not. If the predicates concerned were taken as part of an item's description for use in the Characterisation Postulate, such an item would be this way have properties completely specified, through the Characterisation Postulate, and would thus be completely determinate. Such a method of determination could be applied to nonentities, and their properties could thus be completely specified, but in a way that is very arbitrary. Such items would not thereby be conjured into existence - that such properties can be determined in such an arbitrary fashion reveals that the items do not exist. The method can be used to determine in a similar arbitrary way the properties of some impossible items as well as possible ones, and also to completely specify possible worlds, by assigning functions which determine for each proposition and its negation which of them holds in the world. Worlds which do not exist can thus be completely specified. But such worlds are not therefore made to exist merely by being completely specified, any more than objects are. Or again, consider consistent objects of a categorical logical system: they may not exist but they are completely determined (up to isomorphism). The completeness criterion, taken as a sufficient condition gives, then, quite the wrong sorts of results, results furthermore incompatible with the spare ontology of noneism - so it is contended.

The case is very far from conclusive, as an attempt to fill out details of the sketch soon reveals. Consider the alleged completely specified object. There are two major obstacles in the way of any such specification being appropriately complete. Firstly, the specification is made by way of predicates, but properties far outrun predicates (and indeed there are more extensional properties than real numbers). Secondly, not all predicates are reliable, so appeal to the Characterisation Postulate is strictly inadmissible. Consider next categorical systems. The objects of such systems are invariably very incomplete (their categoricalness depends on this), with respect to all sorts of ordinary characterising features. So it is also with worlds. We may have the idea that we are specifying some sort of variant on the universe we live in, but in practice it is never like that, and the models designed and used are very incomplete as to properties,[1] and lack the detail of the worlds of major works of fiction.

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[1] There are also some large and dubious partist assumptions at back of the idea that a world can be completely specified atomistically, from atomic wff by (transfinite) inductive clauses - even supposing a suitable well-ordering of atomic objects and their initial attributes could be obtained to begin from.

Much of the trouble derives from the platonistic assumption that other worlds exist and are pretty much variants on the actual one. The picture is mistaken - no other worlds exist - and here seriously misleading.

A further related objection emerges from the complete specification objection to 5F, the other-worlds-duplication objection, which, if it worked, would be a general objection to all class-of-properties criteria for existence. It is that whatever criterion is invoked to separate entities from nonentities can be applied in other worlds to separate entities from nonentities there. The intended conclusion is that the actual world cannot be pinned down qualitatively, but only relationally, by relations to entities in it. The premiss is true (A↔B, yields through (A↔B)(T), A(a) iff B(a), for deductively normal a), and unproblematic, but it does not support anything like the intended conclusion. For the actual world $\underline{\underline{T}}$ can be separated from other worlds (as in 1.24), truth can be determined, and class-of-properties criteria applied in terms of what is true (for the actual case, as opposed to some alternative). There is no need to proceed beyond what holds in $\underline{\underline{T}}$, since all objects are in the domain of $\underline{\underline{T}}$.

Given that condition 5P stands, option (4) is viable, and option (1) is not closed. For option (1) turns on narrowing the class of features admitted to some subclass dt of extensional properties. Thus if 5P were counterexampled so also would be the new criterion

53. x exists iff for every f in dt, x~f iff ~xf.

The problem, to which no plausible solution has been found thus far, is how to characterise dt features. Classes in the vicinity of physical properties, for example, will not serve, if quanta are indeterminate. Nor will classes distinguished by such notions as verifiability or decidability by investigation help. For some of the troublesome, non-dt, properties are of this sort on many occasions. Moreover the notions invite the question, by whom?, and look like bringing unwanted observers (who have to be entities) back. Nor will notions such as detailability or refinability - features properties of nonentities characteristically lack - do this job: but they do suggest a different approach.

§7. *GROUP 6: Qualified determinacy and genetic criteria.* It is not then, as the classical theory would have it, that entities are totally determinate and nonentities are totally indeterminate. It is just as erroneous to hold, as the standard Meingonian approach does, that entities are totally determinate and nonentities are only partially so. For, as we have seen, entities can share some of the indeterminacy usually seen as the exclusive attribute of nonentities and (in this case) the difference in determinacy between entities and nonentities seems to some extent be a matter of degree. It can hardly be satisfactory however to see existence as a property possessed in greater measure by some things than others: existence is not a matter of degree, a comparative feature, but an absolute one.[1]

This does not mean that there is nothing in the incompleteness idea. The idea that entities and nonentities can be distinguished through completeness fails for completeness characterised in terms of all extensional features, but can still be correct for a subclass of such properties. That is, the distinction can be made in terms of "partial completeness", so to say, either through a class of properties for which is true either that entities are complete and nonentities not so but have at best only some such properties, or else through a class for which entities are partially complete (i.e. they have some or many of them). The first alternative has already been considered (in §6). The second alternative also offers promise, for it does seem that there is a class of properties for which it is true that entities, even it not completely determinate with respect to them, at least do have some or many of them, whereas nonentities do not have them at all. These are certain referential features such as empirically determined or ostensively-discerned features. Many well-known examples can be invoked: what were the songs the Sirens sang, and who was the mother of Hecuba? If Hecuba and the Sirens existed the questions would be answerable in principle and suitable details forthcoming. Similarly with such questions as: how often did Sherlock Holmes eat turnips? How long were the lines on his cheeks? etc. If Holmes existed, even if we could not (for technical reasons) ascertain the facts, the questions would have determinate answers. Such data is part of the orthodox case for the claim that nonentities are totally indeterminate. But of course it does not show this at all; if only shows that there are certain sorts of questions about them that lack determinate answers. The orthodox case involves a some-to-all fallacy. The argument does not show that one can say nothing true about nonentities - only that what one can truly say about them is more limited than with entities. In the case of entities we can go on to detail such further features, to find out in principle at least by further investigation much more about their independently possessed properties: their features are detailable and refinable.

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[1] In the popular sense of 'exists' where 'exists' means 'alive' (an extension of OED sense 3) existence can have degrees. Full existence is had only by the really alive. In this sense, in contrast to sense^1, existence is like perfection in admitting of degrees.

In the case of nonentities we almost always come to a rapid halt, to a barrier beyond which no more detail can be provided; even in principle questions seeking more detail cannot be answered (i.e. given determinate answers), and there is no way of establishing the truth even in principle of such questions. These are the facts which motivated the idea of the distinction between entities and nonentities lying in completeness. But they are just as well taken up in terms of partial completeness, the total incompleteness of nonentities with respect to a subclass of properties. The leading idea is of course that there are ways of finding out about entities that are not available in the case of nonentities, ways that are somewhat independent of (for present purposes, question-begging) observational features, such as detailability, and refinement of detail, ways that are logically tied to tests for distinguishing what exists from what is only imaginary, etc. (and analogous tests, sometimes applied in courtroom procedure for distinguishing truth from lying, consistency in the elaboration of detail).[1]

What is the class of properties with respect to which nonentities are indeterminate? One answer can be given in terms of the way in which nonentities, in contrast to entities, acquire their properties. Nonentities acquire their extensional properties in virtue of their characterisation, their Sosein, that is in a nonreferential way. Thus there appear to be two (classes of) ways only for nonentities to acquire (nonconsequential[1]) properties - first through assumption and characterisation (e.g. through the Characterisation Postulate and through source books) and secondly through intensional determination. But with entities there is a third way, which is missing in the case of nonentities. Entities can be ascribed properties in virtue of Sosein, but they can also, unlike nonentities, acquire properties from Sein, i.e. (referential) properties, which they acquire as a result of their behaviour in the real world, **G**. Because for nonentities there are no corresponding referents in the real world, they are totally indeterminate with respect to their class of referentially acquired properties, i.e. properties which they would only have if there were corresponding referents. This explains why nonentities are determinate with respect to some properties, assumed and intensional properties (and their closure under consequence), but are nonetheless indeterminate in many respects. This much might be thought to be evident, and hardly informative: to exist, analytically, is to have a reference, and something which does not exist cannot have referentially acquired properties but can have nonreferentially acquired properties. *Something exists iff it has referentially acquired properties*. The method is not circular and uninformative however because there are clear independent tests - verification methods, *but* taking us back to perceptual methods, spatial location, etc. - for whether a property is referentially ascribed or not. The question is whether Sosein or Sein methods are essential in determining its truth. If Sosein methods are used essentially, and if all the extensional properties of an object are determined through Sosein methods and Sein methods cannot be applied then the object does not exist. If Sein methods are essential then it does exist. Whether something exists is a matter of how its properties are determined. The test then is in terms of the way the properties *originate* and are *justified*, the methods used essentially to establish the property. This genetic criterion is a (historico-)semantical one rather than an epistemological one, because the test is not in terms of how we come to know, but in terms of the basis of the truth of statements and how truth originates. Similarly it is not syntactical; and there is no invariant class of predicates, e.g. spatio-temporal predicates, which must always apply to entities and can never apply to nonentities. Likewise there is no stable class of referential properties, though properties may be referentially acquired on a given occasion. For, as we have seen, there are comparatively few properties - except properties of the (higher) order of the quarry, existence - that cannot hold of nonentities. The outcome, that existence is a genetic semantical and partly theory-dependent property, that it is not an epistemological or a purely syntactical property, should not be so very surprising. It accords with the conditions of adequacy sketched out earlier.

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[1] The availability of more and more further detail is not a completely exclusive feature of entities, though it is a very important one. It is also a feature, but to a lesser extent of past objects. What complicates matters is that method is important as well as detailability; for deductively closed nonentities of mathematics satisfy certain detailability conditions.

To sum up:- There are essentially three modes of determination of the nonconsequential properties of items, both entities and nonentities - two nonreferential (Sosein) ways and one referential (Sein) way. The two Sosein ways are, first and most basic, through assumption and characterisation and especially through the Characterisation Postulate, which gives logical and analytical truths, and secondly, through the attribution of intensional properties. In neither case is truth of the attribution of a property determined by reference, in contrast in the Sein way there is the attribution of a referentially acquired property to an existing item and truth is determined by reference. There is a striking, if perhaps limited, correspondence between these distinctions and the Kantian classification of knowledge into analytic apriori, which corresponds to the first nonreferential mode, synthetic apriori, which corresponds, to a limited degree to the intensional mode of nonreferential determination, and synthetic aposteriori, which seems to correspond somewhat to the referential model. The comparison is limited but is more convincing when it is reflected that prime condidates for synthetic apriori judgements were firstly things apparently true that could not be fitted into the other categories and secondly moral judgements. This second class at least is certainly intensional in character.

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[1] The contrast term 'consequential' has to be construed in a generous way, to include more than just logical consequences, also (what might be accounted) probable consequences and, perhaps, empirical consequences.

Appealing though the genetic approach is, it is not unproblematic. Firstly, there is a latent circularity: the account is (perhaps despite initial appearances) relative to existents. This emerges in several ways; for example in the appeal to world G, whose objects are existents, in distinguishing referentially acquired or empirically-determined properties; in the implicit assumption of entities who can track an entity's origin (origin-trackers). The latter assumption can be brought out by considering another world than the actual, described perhaps in fiction, where origin-trackers are at work to determine the entities of their world, what has a good root of entitlement to exist. If their methods are the same as ours, how do we tell in terms of the methods applied - which may be very or just like ours - that it is our "entities" that exist and not theirs (which include, let us say, Pegasus). To appeal to ourselves - as paradigms - takes us close to ostension again. Secondly, the genetic approach does not satisfactorily distinguish purely past and future objects from entities.[1] For empirical techniques of the sort the approach suggests apply straightforwardly to past objects, indeed sometimes a past object's entitlement to existential status may be more easily traced than a present object's entitlement. True, it might be objected that we cannot go and inspect purely past objects, so there is a difference; but this response leads into all of the, best avoided, difficulties of verification principles over verification-in-principle. The second objection is not very telling however. Let the criterion deliver present or past existents, and then filter out past entities. Thirdly, the genetic approach fails entirely to mark an evident distinction in fiction between objects that exist within the fiction (or fictional world), e.g. Mr. Pickwick, Scrooge, and objects that do not exist within that fiction, e.g. an afterimage of Mr. Pickwick, the Ghost of Christmasses Past. Whereas spatial criteria seem to work well, the genetic account fails, since both Scrooge and the Ghost have only Sosein features and no Sein features. Again the objection is not damaging. Neither Scrooge nor the Ghost exists, neither have referentially acquired features, but all derive from their source book. But within the story, Scrooge has, but the Ghost does not have (unless the Ghost does exist), such features. In short, the genetic account can draw the requisite distinction. Fourthly - to be mentioned because it happened and can stand as a warning - there is a danger that a genetic approach will open the way to empiricist reductions, e.g. of truth about Mr. Pickwick to truths about their originators or authors. But it has already been seen that such reductions have no better prospects than, for example, reductions of propositions to linguistic origins: the threat of a reduction is not a real or worrying one.

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[1] Len O'Neill made this point and the next, as well as several other valuable comments on Group 6 criteria.

Thus the philosopher who, like Descartes, takes her own existence as paradigmatic, can confidently apply the genetic method, and distinguish what exists by what has referentially acquired properties, e.g. by careful empirical methods.

§8. *Convergence of the criteria that remain.* No rock-hard criterion for what exists has appeared. Nor was such expected. For but little in philosophy is rock-hard, certainly nothing as controversial as criteria for existence (or even the idea of such criteria). Nor is there any prospect of harder criteria, upon which there is broad consensus, while the Ontological Assumption is commonly taken as correct. But for some of us, free from the powerful grip of the Reference Theory, something has been achieved.

The picture at the outset, of various competing criteria giving widely different results, has been removed. It has emerged that some criteria are much firmer, and more defensible, than others, for instance spatial criteria than perceptual criteria; and that mistaken criteria abound. (Along with the latter go bad theories that have allured philosophers into claims that all sorts of things that do not exist, really do exist. Rarely by comparison - unless theism be correct - has the opposite happened, with philosophers claiming of what exists that it does not exist.[1]) What is especially interesting is that the criteria that remain after mistaken and doubtful criteria are put aside, converge. In part this convergence is made possible by the very problems of the remaining criteria, the endemic circularity of the relational criteria and the breakdown of biconditionals in the case of class-of-property criteria.

To indicate the criteria adopted and the convergence:- *All the criteria that remained standing are adopted* within the limitations already elaborated. In particular, the modified spatial criterion BTPS - *the topological criterion - and the genetic criterion are both adopted*, subject to the production of suitable paradigms, and this they themselves provide *in combination with the determinacy condition* 5P.[2]

Apart from the genetic criterion, there are two basic criteria, two poles, to which other criteria converge, and the basic criteria can be integrated. The first basic criterion is the modified spatial. But the success of the criteria that converge on this pole, depends on the successful determination of paradigms (perhaps not merely local paradigms). The criteria converging on the other pole, determinacy conditions, can however be put to work in delimiting paradigm entities. Once some paradigms are established - and we know quite well enough what they are and what will serve - criteria that converge on the modified spatial criteria can be (re-)applied.

The spatial criterion, 12t, (xE,t) iff x has a spatial locale at t, specialises to give, since (xE,0) iff xE, xE iff x has a suitable spatial locale. Under criticism these criteria are adjusted, replacing spatial locale by spatial relations with paradigm entities. This criterion, after repair tends to the topological characterisation BTPS, filling out criterion 41. Now, as already explained, both group 3 and group 4 tend to such a criterion upon rectification of difficulties with them, e.g. in appealing to causal relations. Thus groups 3, 4 and 1 tend to converge. Group 2 criteria are rejected - even so a linkage is afforded through certain choices of paradigms, e.g. as oneself. Once such entities as oneself and other origin trackers are delivered by the criteria, the genetic criterion is woven into the synthesis without incompatibility. Also group 0 criteria can be worked in at no extra cost, and no need to check for compatibility, for, as indicated, the criteria are analytic (on suitable definitions which are easily supplied).

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[1] Genuine scepticism is rare. The comparison suggests that a conservative principle with respect to what is *said* to exist is warranted.

[2] It may even be that one can work back to a characterisation of the unspecified class dt of criterion 53.

The synthezised criteria arrived at have several important corollaries, some of which are drawn out in subsequent sections. An immediate corollary of the convergence is Bretano's criterion. Another outcome is Meinong's theorem. The contingency of all existence is due to the contingency of the paradigms. An allegedly necessary existent, such as God, could not be a paradigm because of the contingency of paradigms, and also because the paradigms are spatially located; but nor could a necessary existent be merely another particular spatially related to some paradigm.

Also forthcoming are various tests for existence, e.g. the qualified completeness and consistency of what exists, features that emerge as before from the determinancy pole.

There is a further convergence on the criteria arrived at, a limited convergence on which not much weight can be imposed, an historical convergence among those who did not allow the Ontological Assumption to dominate what they took to exist, namely nominalists and those who distinguished what exists as a subclass of objects, or differently beings. Among the latter was the earlier Russell, according to whom (in 04, p.211)

> We tend to ascribe existence to whatever is intimately related to particular parts of space and time; but for my part, inspection would seem to lead to the conclusion that, except space and time themselves, only those objects exist which have to particular parts of space and time the special relation of occupying them.

Relations such as equality, Russell at that time contended, are 'essentially incapable of existence' (p.207).[1] Similarly Meinong. Rather similarly many nominalists.[2] Thus what exists according to the accounts of Hobbes, Bentham and Goodman, for example, differ only marginally from what the converging criteria disclose. But they do differ; for instance Bentham tried to restrict what exists to objects of acquaintance by one of the five senses, or more narrowly still, the tactual sense. This would exclude not only many aggregates but most micro objects; and it is far too homocentric to be acceptable without modification.

The upshot is a qualified "nominalism", what was called to emphasize the difference from standard referentially-based nominalism, 'nnominalism'. According to nnominalism, only particulars exist - but particulars include not only individuals in a narrower sense, but also aggregates, corporations ecosystems, etc. What is important is that many things that are not particular, that hence do not exist, can, often profitably, be thought about, reasoned about and spoken about.

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[1] Moore's fluctuating views on what exists sometimes tended to a similar result (cf.53, p.134, p.300): e.g. to exist is to be a constituent of the Universe.

[2] Compare too Boethius: Omne quod est, eo quod est, singulere est.

§9. *A corollary: the nonexistence of abstractions. In particular, (abstract) classes do not exist.* Anomalies in familiar philosophical approaches to universals, such as numbers, have not passed unnoticed. An important anomaly lying behind the "problem of the existence of universals" is this:- On the one hand there is a preparedness to say that universals exist, since they certainly have properties and statements about these properties appear uneliminable. But on the other hand criteria of existence are adopted according to which universals do not exist (especially group 3 and group 4 criteria). The anomaly is of course removed with the removal of the Ontological Assumption. But what is wrong with trying to remove it in the platonistic way, by saying universals do exist? There are many reasons for resisting this suggestion. None of them is conclusive inasmuch as each involves premisses or assumptions that a hard-line platonist could - though often not very credibly - reject.

A first, and basic argument against the existence of abstractions appeals directly to criteria for existence that require locatability (group 3) - so that the argument could be called the argument from the unlocability of abstractions. Whatever exists has a spatial neighbourhood. Abstractions however do not. So abstractions do not exist. Hence also many of the traditional difficulties for the theory of forms, deriving from the fact that forms are not ingredients of the physical world. Both Reid and Meinong argue against the existence of universals, appealing in effect to group 3 criteria, Meinong in a way we have seen, Reid as follows (i, p.374):

> ... where is the circle? It is nowhere. If it was an individual and had real existence, it must have a place; but being a universal 'it has no place' and so 'no existence'.[1]

A similar argument is elaborated in Russell (12, pp.153-4): the relation 'north of',

> like the terms it relates, is not dependent upon thought, but belongs to the independent world which thought apprehends but does not create. This conclusion, however, is met by the difficulty that the relation 'north of' does not seem to exist in the same sense in which Edinburgh and London exist. If we ask "When and where does this relation exist?" the answer must be "Nowhere and nowhen." There is no place or time where we can find the relation "north of". It does not exist in Edinburgh any more than in London, for it relates the two and is neutral between them. Nor can we say that it exists at any particular time. Now everything that can be apprehended by the senses or by introspection exists at some particular time. Hence the relation "north of" is radically different from such things. It is neither in space nor in time, neither material nor mental; yet it is something.

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[1] Reid goes on to argue that universals are distinct from mental conceptions or constructions, because they have quite different properties. Similar arguments appear in Meinong's work and in Russell 12, p.155.

It is, Russell concluded (among other less satisfactory things) a something that does not exist.

Other conditions for existence, which blend with group 3 criteria, also underpin arguments for the nonexistence of universals. For example, the requirement that what exists is capable of acting physically on an entity, likewise excludes universals which are timeless, changeless and so unable to act in the requisite entire way (the point is elaborated in §3). One cannot kick an abstract set or be hit on the head by a property.

The tests for existence also provide bases for arguments. Consider for example, consistency. Some abstractions are impossible objects, e.g. the Russell set, the impredicativity property. They cannot exist. But if they cannot exist nor it seems can several other items, e.g. the anti-Russell set $\{x{:}x \in x\}$ and every set of which it is a part, e.g. the universal set. So far the consistency requirement only shows that some abstractions do not exist; but it leads on to two connected points. Firstly, how can the abstractions if any that exist be suitably distinguished from those that do not? Secondly, since we have apparatus for talking about those that do not exist, why try to draw some more or less arbitrary line separating off those abstractions that do not exist? On the theory of items one is let out entirely of the "problem" of trying to draw a line between abstractions that exist and those that do not: one can say the commonsensical almost obvious thing, that none exist. But, consider the first point, it has often been supposed, at least in the case of attributes, that a satisfactory line can be drawn: attributes exist iff they are fully instantiated by entities (thus Mill, Wittgenstein, NE, Armstrong 78), e.g. f-ness exists iff there exists an x which instantiates f-ness.[1] But why say that entity-instantiation is existence, when the requisite distinction is adequately marked out in the terms already given, i.e. as entity-instantiation? The main reason appears to be the appeal of the thesis that if there exists an x such that xRy for some relation R then y exists, i.e. of an unqualified Brentano thesis with R the instantiation relation. But, as we have seen, only a much more sharply qualified Brentano thesis is correct. Furthermore, application of the required Brentano form, using the instantiation relation, would lead to collapse of the supposed distinction of attributes into existing and nonexisting. For let U be a universal property that everything has, e.g. self-identity. Then U exists, since an entity instantiates it. Also subproperties of U presumably exist, since the subproperty relation transfers existence if the instantiation relation does. But all properties are subproperties of a universal property, so all exist, contradicting the instantiation condition. Again, impredicativity is instantiated by properties that are instantiated, such as roundness and redness. So impredicativity exists, contradicting the consistency requirement.[2]

The main reason for the temptation to equate existence and entity instantiation thus breaks down. There are also other reasons for rejecting the equation. First, there is the following dilemma:- If the instantiation is by entities that exist in the ordinary sense then since they come to exist and pass away, so will properties, e.g. the property of being a passenger pigeon used to exist but no longer does. But properties are not time-dependent in this sort of way. If, on the other hand, instantiation is by sometime-existents, then other serious results ensue. For example, the properties that will solve all our problems exist, if ever in the future property-solutions are applied. It may become the whim of a scientist whether certain properties exist. And so on. But properties are not so dependent on scientists' desires and ambitions. Secondly, there are difficulties, generated by series arguments, for any criterion that tried to draw a nonvacuous line, such as the instantiation condition. Consider numbers, which are properties and which form series. Where do the numbers start and stop existing? On the face of it, applying the instantiation test, 0 does not exist, but 1 does. Yet 0 and 1 seem so like one another that their existence should stand or fall together. Similarly with the higher cardinals. There will presumably be a point in the cardinal hierachy where cardinal numbers cease to exist because no instantiators exist,[1] yet as regards the features that have important links with existence, there appear no relevant distinctions between those just above the line that do not exist and those below that do - unless the line is so drawn, implausibly, as to rule out all infinite cardinals. If the Ontological Assumption is accepted, as it commonly is by those who endorse the instantiation condition, then the condition is liable to rule out much of mathematics, in particular analysis is in much doubt, and its truth depends on accidents about what exists, about whether enough things will at some time exist to jointly instantiate big properties. A corollary, which only a good deal of fast talk can avoid, is that many of the central truths of mathematics are contingent, e.g. that for every prime number there is a larger prime. This is surely wrong: the truths of calculus, for example, are necessarily true, not contingently so. Thirdly, if properties exist the corresponding sets, the sets of objects or the sets of entities that have the properties, should also, it seems, exist; for their logical behaviour is very similar to that of the properties, indeed there is an isomorphism preserving important logical features. But sets do not exist.[2]

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[1] Cf. too Reid's explanation of exist in. Under the instantial criterion of NE, $fE =_{Df} (Px)(xf \,\&\, xE)$. Thus $\vdash fE \leftrightarrow (\exists x)xf$.

[2] The latter argument can be broken by distinguishing individuals and properties and requiring instantiation by existing individuals, and by restricting the significant use of the non-applicability relation defining impredicativity to properties.

Another important test for existence is determinacy. Some abstractions certainly do not satisfy this test, e.g. the anti-Russell set (the set of all sets which are members of themselves) is indeterminate as to whether it is self-membered or not. Consistent classically-formulated set theories will be incomplete at many points, as limitative theorems and independence results show. But what is incomplete in the way that sets are, does not exist. Again, the argument only shows that some sets do not exist. The indeterminacy phenomenon whoud be much more widely realised were it not that the abstractions have been shielded from extensive indeterminacy in their features by a significance filter. Consider, for example, the predicate 'dislikes dancing'. It would yield incompleteness since 'the number 7 dislikes dancing' is not true, and nor is its negation, 'the number 7 (does not dis) like(s) dancing'. The incompleteness so produced vanishes, however, when both are ruled nonsignificant.

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[1] Realists about sets may deny this; but they store up other difficulties for themselves, e.g. Cantor's paradox. However they have good reasons to deny an instantiation condition.

[2] This claim will no doubt be hotly disputed: it is defended below. Interestingly, proponents of properties (e.g. an early Russell, Armstrong) held that though properties do exist, sets, which can be contextually defined in terms of properties (cf. PM, *20), do not.

A final important test for existence which abstractions fail is defensibility. If sets, for example, do exist then they should be fully assumptible. But if they were then, classically at least, triviality would result. Also if they were, then, since a stronger set abstraction axiom would follow, any theory of sets would be inconsistent. Since these results do not hold, sets do not exist. The argument of course takes sets en bloc, and really it is only some sets that lead to trouble. So the argument can be deflected by saying, for instance: the following sorts of sets exist, where follows a list of postulates such as those for Zermelo-Fraenkel set theory, ZF.

But the different claims of rival set theories as to which sets, if any, exist leaves a problem. For instance, is set existence merely relative, so that the universal set exists according to Quine's ML but does not exist according to ZF. Surely not? For back of the various modern theories which attempt to explicate set theory in a consistent and complicated fashion is an absolute (presumably inconsistent) notion of set, the intuitive notion, properties of which are still examined in elementary courses on set theory, and in terms of which much thinking about sets is carried on.

If sets (which are thoroughly transparent objects, at least in orthodox logical settings) exist, it should be easy enough to tell, at least outside infinitary cases, which ones do. It isn't: the matter is vexed by rival existence tests. For consider sets some of whose elements do not exist. Surely a set cannot exist unless its members exist, all of them. Thus a definition of class existence such as that in PM*24.03, according to which a class exists iff an element of it exists, $\exists!\alpha =_{DF} (\exists x)(x \epsilon \alpha)$, is defective. For a class some of whose members exist and some do not (not a possible case on the intended theory of PM), e.g. the class {J.J.C. Smart, the round square}, has at best a part overlapping reality, and so has no claim to exist. Whitehead and Russell are surely right however - as opposed to other set theories - that the null set does not exist.[1] For its existence would be existence ex nihilo. Existence cannot be manufactured out of nonexistence by the magical process of set abstraction (putting braces around nothing as with {}). For similar reasons none of the sets of the favoured model of ZF set theory exist; for all the sets involved are constructed from the null set.

Among abstractions sets are often singled out for special consideration, e.g. because they are taken to be extensionally clear and distinct objects. And certainly they are fundamental in mathematics and in order to make due applications of many other abstractions. The thesis that sets do not exist is a longstanding one. What is more, there are several arguments, beyond those considered generally for abstractions, and beyond the paradox arguments, for the thesis. None of these arguments is conclusive, but they add to unease about the platonist assumption that classes are perfectly coherent objects which exist. In the first place,

> arguments of more or less cogency can be elicited from the ancient problem of the One and the Many*

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[1] Although this is so on the official definition of class existence in PM, in another perhaps less misleading sense the null class does exist. For $(\exists x)(x = \Lambda)$, and, more generally, Λ is a term that can be existentially generalized upon (cf. PM, p.196).

*Briefly, these arguments reduce to the following:

> If there is such an object as a class, it must be in some sense one object. Yet it is only of classes that many can be predicated. Hence, if we admit classes as [existent] objects, we must suppose that the same object can be both one and many which seems impossible. (PM, p.72).

The argument were it cogent would show not just the classes necessarily do not exist but that such objects are impossible. The argument is characteristically defeated by a distinction of predicates: a multi-element class is one object which contains many objects. It is as well the argument is so defeated, for a parallel argument would appear to show that there could not be aggregates, such as flocks of sheep or senates. More favoured nowadays are arguments against classes based on their excessive numbers and their excessive multiplicative capabilities; for example, what exists cannot be multiplied up exponentially in the way that sets are by the power set operation (cf. Goodman[1] 56, repeated by Armstrong 78, p.31.)[2] Thus according to Armstrong - to take an excerpt from a passage that is strong in rhetoric but weak in argument -

> The extraordinary and incredible proliferation of entities which results when we countenance both objects and classes of objects in our ontology has been emphasized by Nelson Goodman ... . One starts with individuals, forms all the possible different classes of these, which yield many further entities, and then one goes on to classes of classes and so on upwards to infinity. A sober Empiricist must be appalled by the way entities are so easily manufactured. By comparison,

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[1] Sadly, celebrated nominalists like Goodman are seriously short on arguments against taking classes as values of variables. Apart from the indicated worry about power set multiplication of objects, the case in The Structure of Appearance reduces to these points (p.25 ff.):

1. Classes are 'essentially incomprehensible';
2. Classes 'people' the 'world with a host of ethereal, platonic, pseudo entities';
3. Classes differ where there are no differences in content.

Point 2 is no more than old-fashioned positivist abuse, and carries no weight once the Ontological Assumption has been abandoned; point 3 depends on a restrictive account of content, and fails on a different appealing account that set theory can itself supply; and point 1 is unpersuasive, unless the verification principle is still persuasive; for parts of naive set theory and leading properties of classes are readily comprehended even by those in elementary school.

[2] Similar points apply against properties, some of which Armstrong thinks exist. Just as exponentiation of properties can be restricted (though with serious costs to mathematics; see §10), so exponentiation of sets can be restricted, and is restricted in ZF set theory, though at rather large numbers - an example of Russell's limitation of size, concerning which Russell asked astutely (what makes perfectly good noneist sense, though Russell found it paradoxical): where do the numbers stop existing? One might also ask why they stop existing where ZF - but not extensions of ZF - has it?

> one can only be astounded at the moderation displayed by, say, the supporters of the Ontological Argument.[1]

Unchecked reproduction in some natural populations, e.g. blowflies, similarly exponentiates the numbers of the population in a series that diverges (towards infinity). (The sober empiricist is presumably appalled at the way blowflies are so easily reproduced.) Exponentiation in numbers, or varieties, does not tell against existence. A more telling objection (one the intuitionists make) to classical set theory is that it applies power set exponentiation to infinite sets: but in order to get started on this enterprise, it has, at least in currently certified set theories, to postulate the existence of an infinite set. It is not unreasonable to dissent from this postulate; it is hardly - certainly on noneist perceptions it is not - logically necessary.

These arguments are plainly somewhat condensed; and the obvious filling in of steps leads back to presupposed assumptions about what does exist; in particular, what exists is limited in number and is not a matter that is amenable simply to logical or other manipulation. These assumptions are correct; but their defence takes us back over ground we have already travelled, to criteria for existence.

If many of the rather few arguments to be found in the literature against the existence of classes are somewhat feeble, some of those in favour of the existence of abstract classes withstand even less scrutiny, notably those based on the Ontological Assumption and on the alleged need for classes in theoretical business. There are however two arguments of rather more substance to consider first. One of these is an argument from the existence of elements of sets, beginning with individuals, to the existence of all sets formed by set composition from these elements; the other is an argument from the existence of aggregates and natural classes to the existence of abstract classes.

If sets do not exist, how is set theory possible? In a neutral fashion, with sets objects that do not exist. But surely sets of entities can be formed? Yes, of course. But they must exist. Not at all; let a be such a set, and entity b be a member of a, i.e. $b \in a$. The crucial point is that the membership relation, which is extensional, does not transfer existence from b to a. Set theory (and similarly attribute theory) with nonexistent abstractions is possible because membership is not a Brentano-relation.

The second argument tends to go like this: You admit the existence of flocks of sheep, squadrons of airplanes, parliaments, and (once anyway) herds of buffaloes. But then you have already granted that some classes exist. The evident reply is that the assumed equation of aggregates and collections with abstract classes is unjustified; for the objects are different in kind and have different sorts of properties. For example, aggregates are typically transitive, sets corresponding to aggregates are not transitive. For example, an aggregation of flocks of sheep is a flock of sheep, but a set of sets of sheep is not a set of sheep (cf. also Prior's sheets of paper example which he uses in explaining mereology, 62, p.299). Aggregates behave, as the example indicates, more like the objects of Lesniewski's merelogy, mereological-classes as they are sometimes called, than sets - more like but not the same as, for natural aggregates may change over time, they may change membership, they may be disbanded, etc. Furthermore, the appeal to natural collections, even if it succeeded, would yield very few of the classes considered - or needed? - in analysis.

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[1] Armstrong has however correctly discerned a theological aspect of modern set theories. Both standard set theories and the Ontological Argument depend upon Characterisation Principles which mistakenly assign existence to the objects yielded by assumption. The apparent moderation of the supporters of the Ontological Argument would soon vanish if the supporters were to apply their excessively powerful Characterisation Postulate elsewhere.

Which takes us to another familiar argument. Discourse about classes is essential for one purpose or another, e.g. parts of higher mathematics and (more important in these latter enlightened days) the physical sciences; being essential the statements of this discourse are true (that amazing pragmatist assumption);[1] the objects of this true discourse must exist; so classes exist. But, once again, the existence of classes is not required; neutral mathematics can undertake all the genuine work involved. On the other hand, since valid, the argument becomes a powerful one against anyone who accepts the premisses. It is powerful against those who, like Armstrong, accept the Ontological Assumption, and the truth (or, more strongly, logical necessity) of mathematical statements (see Armstrong 78, vol. II, p.167), yet deny that abstract classes exist (78, p.34. p.128). For it is certainly the case that a great many mathematical statements, e.g. of analysis and algebra, concern abstract classes of one sort or another. In fact Armstrong's first philosophy, and more generally scientific realism, is in very serious trouble with mathematical truths (see §10).

A corollary of the fact that sets do not exist is the following:
Proposition. Most things do not exist.
Proof. No sets exists. There are at least nondenumerably many sets, by Cantor's theorem neutrally formulated. There are at most denumerably many existent objects. Therefore, there are more sets than existents, in fact more by a very large order of magnitude, as reiteration of Cantor's theorem through higher cardinalities shows. Hence most objects do not exist.

There are some minor philosophical problems about the number of entities. For although the number is, presumably, countable - no analogue of Cantor's argument works for particulars, which are not combinable into further particulars by any analogue of the power set operation - there are not always sharp criteria for individuating particulars. Thus, for example, how many clouds are in the sky today matters for how many entities there are; but this may not be settlable without some arbitrary decisions. The actual number of entities is however not of great interest (unless of course it is said to be, what we know it is not, some surprisingly small number, such as the one of monism or the six of Meyer's sexism): more important is the order of magnitude involved, in particular whether the number is a very large finite one or aleph zero. Resolving the latter issue includes much that is no longer accounted philosophy, e.g. settling between finite and infinite theories of the natural universe.

What does raise serious philosophical problems is the question of the number of objects. The problem is compounded by the logical paradoxes. The blocking of Cantor's paradoxes on the usual set theories at the same time blocks an answer to such significant questions as, What is the number of objects? What is the number of numbers? On dialectical set theory the problem disappears (or reduces to the "problem" of isolated inconsistencies). The set of all objects U (= $d(\underline{\underline{T}})$) is what it appears to be, and is demonstrably on naive set theory, an inconsistent totality. The cardinal number of U is both less than the cardinal number of the set of subsets of U, i.e. of the power set P(U) of U, by Cantor's theorem, and also not less than the cardinal number of P(U) since $P(U) \subseteq U$. That is, the argument of Cantor's paradox is simply accepted as a fact about the universal set and its cardinality. The number of objects is $\bar{\bar{U}}$ (i.e. the cardinal of U) and is the same as the number of numbers, the largest number. For as numbers are objects,[1] there are at least as many objects as numbers. But the numbers of objects cannot exceed the number of numbers, for then some number would be larger than the number of numbers.

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[1] This pragmatist assumption is avoidable. Truth of the discourse can be argued on other grounds. Then the argument becomes just a direct application of the Ontological Assumption.

The main conclusion reached is that abstractions, such as sets, do not exist. Nor do they subsist or have some inferior or weaker form of being: they have no being at all. But of course sets may be classified in other ways, e.g. as corresponding to existing aggregates or not, as consistent or not (a beginning is made in investigating such a distinction in UL).[2]

That abstractions do not exist is an important part of the case for Meinong's thesis that nothing necessarily exists. For logically necessary existents would be expected, if anywhere, among abstractions. But now, as no abstractions exist, logically necessary existents must be looked for among particulars. Every particular that exists, exists however contingently. The arguments for the latter claim derive, like those for the nonexistence of abstractions, from the criteria and tests for existence. For example, it is a contingent matter that anything is located where it is, or located at all in the actual world; existence of a particular, like the location to which it is tied, is contingent.

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[1] There is a separate question as to the number of bottom-order objects (i.e. objecta), the answer to which turns in part on the axioms for objects admitted.

In 78, Parsons discusses two global issues. The first under the heading 'are there too many objects?' is an analogue of a paradox about propositions (Russell 37, Appendix B). The paradox, which is something of an embarrassment for Parsons' theory, does not arise in the present theory, because two crucial assumptions used in the argument fail, namely, the assumption that every plugging-up of a nuclear predicate with a term yields a nuclear predicate (which appears certainly false), and the correlation of objects with sets of nuclear properties. Russell's paradox is, by contrast, a semantical "paradox" and its conclusion is simply accepted on the paraconsistent theory. The second issue, 'are there two few objects?', concerns nonsignificant terms, and is easily accommodated in the significance enlargement of the present theory (in the way already explained in Slog, chapter 7).

[2] Similarly different criteria for the possibility of properties can be investigated, much as criteria for attribute existence were studied in a preliminary (and ultimately unsatisfactory) way in NE. For example, possibility of properties may be defined thus: $f\Diamond_2 =_{Df} \Diamond(Px)xf$, or more plausibly: $f\Diamond_1 =_{Df} (Px)(xf \;\&\; x\Diamond_{\cdot})$. Hence $\vdash f\Diamond_1 \leftrightarrow (\Sigma x)xf$; $\vdash fE \rightarrow .\; f\Diamond_1 \;\&\; f\Diamond_2$; $\vdash f\Diamond_1 \rightarrow f\Diamond_2$, but not conversely. Since Meinong's squound has the property of squoundness, (squoundness $\Diamond_2$), but ~(squoundness $\Diamond_1$); so $\sim(Uf)(f\Diamond_2 \rightarrow f\Diamond_1)$. Other different definitions of possibility may be proposed too, for instance $f\Diamond_3 =_{Df} \Diamond(\exists x)\,xf$. Under this proposal nonexistence is impossible; $\vdash \sim[(\sim E)\Diamond_3]$!

§10. *Further corollaries: the rejection of empiricism in all its varieties, as false.* Empiricism comes, it is often said (e.g. Hospers 56, p.87), in two forms: as concept empiricism, according to which 'all the ideas, or concepts, which human beings possess come from experience', and as judgement empiricism, or simply empiricism, according to which, in one initial formulation, 'experience and experience alone enables us to know ... that our judgements are true' (56, p.90). Judgement empiricism is commonly taken to imply concept empiricism, the assumption being the Lockean one - ensured by traditional logic - that judgements are built up from concepts (hence the deletion of the qualifying term 'judgement'). But the converse inclusion does not hold since a statement all of whose concepts are empirical may not be empirical, but may be analytic or inconsistent.

The orthodox connection between judgement empiricism and concept empiricism has however been challenged by some empiricists, notably by Armstrong 61 on the questionable ground that the Lockean picture would do damage to his theory of perception. Other grounds however support the challenge: judgements cannot be construed simply as strings of concepts (as is explained in Slog, p.62 ff.). Given rejection of the Lockean picture

> What becomes of the Empiricist contention that all our concepts are derived from experience? ... it will have to be translated into the contention that all our concepts are derived from the acquisition of knowledge of particular facts about the world gained by means of the senses (61, p.126).

This modified concept empiricism has concept empiricism rest upon judgement empiricism rather than vice versa. Even so the modified form falls with judgement empiricism (since it presupposes it) just as the unmodified form does (since it implies it).

The connection of the two forms of empiricism is accordingly not undone. For suppose concept empiricism is false. Then there is some concept c not derived from experience or not derived in the modified way. Let a be an object which is significantly c (there must be such an object if c is a significant notion). Then either "a is c" or "a is not c" is true. Take whichever is true; call it s. Statement s can be known: for it can be believed, since anything (true) can be believed; and there can be reasonable grounds for it, since it is true. But s is not derived from experience (alone), since c is not. Hence judgement empiricism is false.

To turn this hypothetical argument into a categorical one it suffices to show that concept empiricism is false. Then empiricism is false in both forms. Concept empiricism is false, firstly because creatures[1] have concepts acquired not through experience but by genetic inheritance. Infant animals reveal this, they know how to do various things without observation or learning; e.g., a baby bird upon leaving its next knows how to perch, it does not need to learn this in the way it learns to be frightened of humans; a chicken can recognise given shapes (cf. Droscher 69, p.4) without any teaching. Nor is there any reason why a creature should not have concepts programmed in, so to speak. Inherited concepts are by no means the only ones that appear, prima facie at least, to refute concept empiricism. Logical and mathematical concepts that have no basis in sensory experience provide further counterexample: e.g. the Ackermann groupoids of interest in the algebra of relevant logics do not derive in any evident way from experience. Examples are easily multiplied.[1] Conceptual empiricism is sometimes stated in such a way as to allow for this, e.g. Locke is said by Pap (58, p.63) to hold that 'all simple ideas originate from sense perception and/or "reflection" (i.e. introspection)', which would, as first sight, appear to allow for nonempirical mathematical concepts. However given Locke's famous model of the mind as a tabula rasa before any experience, Pap's interpretation is in doubt. By 'reflection' Locke meant reflection on ideas already supplied by the senses. Locke does not then qualify his concept empirism in the way Pap has suggested.

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[1] Notice that a beginning has been made on removing the human chauvinism that is embodied in typical formulations of empiricism, e.g. the dubious restriction to 'concepts possessed by human beings' and the emphasis on 'our judgements' in Hospers' formulations. Of course this is a mild form of chauvinism compared with the view, that would be bizarre were it not so often taken seriously, that things depend for their existence or character on the sort of faculties humans are equipped with.

The typical arguments for concept empiricism, presented by empiricists from Locke on, are quite inconclusive. They consist of but a few examples of concepts not supplied by observation, usually broadly fictional concepts such as dragon and winged horse, with an indication of how these derive from experience as compound ideas compounded from simple experiential ones. The selection of samples is not however varied enough to provide even the beginnings of a good inductive argument. In short, the case for concept empiricism is, and always has been, seriously flawed. There is no good reason to suppose the doctrine true, and reason to think it false.

Refuting empiricism by refuting concept empiricism does not explain why empiricism is so tenaciously adhered to, or get to the bottom of what is wrong with empiricism. To explain these things, and to enlarge on the case against empiricism, a different more direct approach is better.

The traditional thesis of empiricism, i.e. judgement empiricism is, to use the commonplace (though, it is sometimes correctly said, excessively simplifying) slogan, that all knowledge is derived from experience. Modern, or logical, empiricism has qualified the thesis from the above form (the form Kant criticised, and modified, in his theory of mental addition and emendation; see 34, B1) to exclude analytical knowledge, i.e. knowledge of analytic statements. Thus

> the fundamental tenet of modern empiricism is the view that all non-analytic knowledge is based on experience (Hempel 52, p.163, emphasis added),

a thesis Hempel calls 'the principle of empiricism'. Evidently logical and traditional empiricism coincide given the modern thesis, supported by linguistic and conventionalistic theories of analytic truth, that analytic knowledge also derives ultimately from experience. However such a thesis is very controversial and no doubt false: it will not be presumed.

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[1] It can no doubt be said that these notions arise from logical or mathematical experience. But in the sense in which this is correct it does little to show that they derive from observational experience.

Both the thesis and the principle are *epistemic* doctrines, as to the source of knowledge or, as is sometimes said, of certainty. Yet it is evident enough that these principles are linked with, and admit of, *semantic* reformulation, reformulation in terms both of truth and of meaning. Such reformulation would also have the decided advantages of making noneist assessment of empiricism rather more straightforward (since noneism is presented primarily as a semantic theory, and not in epistemic terms: but epistemological corollaries have already been derived and applied and will be considered further subsequently). Fortunately semantical reformulations of empiricism are not far to seek, an initial formulation being obtainable from the OED definition of 'empiricism' as the doctrine that

EO. The sole criterion of [nonanalytic] truth is experience,

which is expanded to the thesis that truth and knowledge are based entirely on observation and experiment. Traditional and logical (positivist) semantic versions of empiricism thus take the respective schematic forms:

truth (of declarative statements) $\underset{\sim}{\mathrm{R}}$ *experience*; and nonanalytic truth $\underset{\sim}{\mathrm{R}}$ *experience*

where $\underset{\sim}{\mathrm{R}}$ is a relation of basis, derivation or accountability, and experience, represents a certain class of methods, of this worldly observation and experiment. Thus, for example, the latter forms expands to principles such as

TEO. Nonanalytic truth can be entirely accounted for experientially,

i.e. at bottom in terms (of certain sorts) of experience; or in brief: *Nonanalytic truth is a matter of experience*.

The epistemic formulations (in terms of knowledge and certainty) and the semantic formulation (in terms of truth, and also of meaning) are logically interconnected through analyses of knowledge. To illustrate the connections let us apply Russell's analysis of *x knows that A* as *x believes that A and x has good (reasonable) grounds for A and that A is true*,[1] i.e. roughly knowledge is true grounded belief (not too much hangs on the specific choice of analysis however, as the argument works with other, perhaps superior, analyses.) Firstly, if knowledge entails truth and truth is always based on experience then knowledge must be likewise based, since knowledge is restricted to what is true; that is, the semantic formulations yield the corresponding epistemic formulations given only that *x knows A* entails that *A is true*. For the converse, the argument is like that connecting concept and judgemental empiricism, and involves an assumption to the effect that whatever is true can be known.[2] Suppose that knowledge is always based on experience, that is, true grounded belief is so based: the object is to show that the truth of arbitrary statement A is also so based. Now A, since true, can be believed; for whatever is consistent can be believed. Moreover there can be reasonable grounds for this belief, e.g. in terms of a theory about things like those A is about. Call an appropriate believer who has such reasonable grounds, God. Then God knows A. Hence, by the hypothesis that knowledge is based on experience, A is so based, completing the equivalence argument. An examination of empiricism can proceed then, without loss, in semantic terms.

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[1] The analysis is an analysis of knowledge *that*, not knowledge simpliciter This simple point alone removes some recent criticisms of the analysis and of such analyses in terms of qualified true belief.

[2] The assumption concerns *each* statement that is true, not the sum totals of truth and knowledge.

It is important, in getting to grips with empiricism, to clarify both the experiential basis, experience, and the accountability or derivability relation, $\underset{\sim}{R}$. The relation $\underset{\sim}{R}$ need not be a reduction relation: empiricists are not stuck with the implausible proposition that all nonanalytic truths are translatable into, or replaceable by, classes of observation statements. No Baconian empiricism is called for: hypothetico-deductive and other methods are open to empiricists: Baconianism and operationalism are optional, and very dubious, extras. How then is the relation to be explicated, the basis metaphor spelt out? The matter remains obscure. The more promising proposals - all of which have broken down - can be discerned in attempts to state the connected empiricist criterion of meaning in a satisfactory fashion. They are:

1) The relation is one of deducibility or testability (cf. the principles discussed in Hempel 50, pp.45-50).

2) On a more syntactical approach (initiated at a time when syntactical expression of semantics was still favoured), satisfying the relation is converted into expressibility or partial expressibility in a suitable empiricist language (cf. Hempel 50, p.50 ff). Indeed the mistake is sometimes made of redefining *empiricism* in terms of this proposal: e.g.

> empiricism [is] ... the thesis that a uniformly observational language is capable of expressing all of our scientific system of beliefs (Scheffler, p.187).

The mistake is like that of reformulating positions on universals in terms of what is quantified over.

3) A newer approach where accountability is taken up through a recursive truth definition.

The syntactical approach, which was elaborated by Carnap and Hempel (50, and references cited therein), had of course some of the inductive features the *derived form* relation of the commonplace slogan suggests, e.g. in the formation rules of the empiricist language which inductive rules of truth typically copy; and it presupposed a semantical basis through restrictions imposed on the underlying empiricist logical language. For example, the empiricist language contains as extralogical constants only referential subject terms and observation predicates (cf. Hempel's discussion in 50, pp.51-2, and of Carnap's translatability criterion on p.43). On the other hand, the semantical approach requires the introduction of some syntax, of the language to which the sentence A whose truth conditions are to be given belongs. For the account takes some such form as the following: The truth conditions for a statement A of language L are determined through the truth definition for language L. Since, however, truth conditions can be so provided for many nonempirical statements, it is important either to narrow the class of languages permitted (as in approach 2) or to curtail the basis of the recursive definition, i.e., in effect to characterise at least partially, in a restrictive way, *experience*.

Restriction is essential to exclude such experience as religious experience, mystical experience, aesthetic experience, moral experience, and so on for other "experiences" which deliver information of a nonempirical sort. The thesis of empiricism must be restricted to empirically admissible experience, to what might be called *pure* experience; that is, the intended thesis is

(TE) Nonanalytic truth is a matter of pure experience.

9.10 THE ASSUMED REFERENTIAL RESTRICTION ON PURE EXPERIENCE

But what is pure or empirically-admissible experience? There are two assumptions as to the character of empirically admissible experience that are invariably made, the first of which is taken to imply the second.

EO. Pure experience is observational; and

ER. Pure experience is referential; or, in semantical terms:

observation and experiment - or evidential methods - never proceed beyond the confines of the actual world of entities. Such an assumption is ubiquitous in the empiricist literature. It appears, for example, in the assumption that any empiricist language in terms of which nonanalytic truths are expressed is a referential language, an extensional language with only existentially-loaded quantifiers, such as classical quantification logic, ZF set theory or PM2: compare the artificial languges Hempel 50 and Carnap 36 chose and the logical frameworks - canonical languages - Quine and Davidson and others have argued for and tried to defend. It appears, in semantical form in the tirades against alternative worlds, possible world semantics, and the like; cf. Mackie, Smart, Armstrong and many others. It appears in the heavy opposition to talk of nonentities, against which verification principles are brought to bear. Thus, for instance, Shapere (65, p.4):

> ... there is a long tradition in philosophy [empiricism] that has looked with suspicion on the entities purportedly referred to by such terms; for science is supposed to be concerned only with what is observable, not with any "metaphysical" entities that may or may not exist behind the scenes of experience but that cannot in any case be observed. And besides, as Hume pointed out, how could such terms have any meaning beyond what can be said in experiential terms?

The observational qualification of EO is taken to imply ER, because observation is equated with veridical observation which is taken to be transparent and of what exists and to be purely extensional, to yield information only about the actual world of entities.

One example, the latest model of empiricism, will serve to illustrate the main points, and to remind the reader of all the other, many other, sources of the empiricist prejudices represented in TE. We are asked to envisage a truth definition - a very considerable elaboration of that supplied by Tarski for certain formal languages - for natural language, e.g. English - or, to take away again much of what was apparently being offered, the empirically significant part of English. In terms of this truth definition all other semantical notions, meaning in particular, can, it is supposed, be duly explained. The truth definition is to be given within the framework of a referential formal language, ideally quantification theory, which contains only observational predicates and as subjects constants classical proper names. Thus quantification is always of what exists, and Leibnitz identity holds without qualification in the underlying logical theory: the underlying language is, that is to say, referential and conforms to strict empiricist standards, those of logical empiricists (such as Hempel and Carnap) already mentioned. The expression of the rest of English - the empirically significant parts that is, the rest being written off in one way or another - is (to be) achieved by way of reduction (cf. Carnap's reduction sentences), philosophical analysis (cf. Davidson's paratactic analysis), and/or linguistic analysis, i.e. transformation into the deep structure represented by the referential formal language. The semantical theory itself is of course referentially pure, it involves no extra parameters that can be interpreted as worlds, and indeed nothing over the one world semantical frame that suffices for the semantical theory of the underlying formal language. The result of a successful semantical theory would then be the provision of truth conditions, measuring up to empirico-referential standards, for every empirically significant sentence of English.[1]

The latest model of empiricism appears, at least when looked at closely, no more likely to suceed than its predecessors. The reason is simple: intensional discourse, which semantically involves transfer to other worlds, cannot be extensionally rendered, i.e. so that no transfer to other worlds is required; and discourse about what does not exist, which semantically involves essential use of a domain $d(\underline{\underline{T}})$ much bigger than the domain of entities $d(\underline{\underline{G}})$ (i.e. $e(\underline{\underline{T}})$), cannot be reduced to discourse about what does exist, which can be evaluated in terms of $d(\underline{\underline{G}})$. There is an escape hatch in the latest model, as in earlier models: discourse which resists rendition, such as some discourse about nonentities, can be written off. But although it may well be written off as not empirical, it cannot be satisfactorily written off as unintelligible or meaningless (see the basic theses, chapter 1, p.14 ff.).

The less sweeping thesis of empiricism, TE, when reflected upon soberly, is also a most unlikely assumption - what a sweeping restriction on truth and its varieties it would impose, if taken as normative or regulative principle. Like many unlikely theses it is false. The thesis is false because it implies, in particular, a restricted form of the Reference Theory, namely

RTR. Nonanalytic truth is a matter of reference.

For TE and ER yield at once such a restricted form of RT. Traditional empiricism implies the full Reference Theory: logical empiricism, though its thesis TE implies on its own only the restricted form of the RE, characteristically takes the full RT for granted.

The restricted theory, RTR, is, so it has been argued at length, false. Many of the counterexamples to the Reference Theory (given in chapter 1) yield counterexamples to TE. It is perhaps enough to recall some of the sorts of examples from theory, fiction and intensionality; e.g. contingent extensional statements about nonentities such as "Pegasus is winged" and "George is square" where 'George' names the round square; intensional statements about nonentities such as "Pegasus is commonly believed to be winged"; and intensional statements such as those of counterfactuals, dispositions, lawlike connections, etc. There are many other ways of locating the trouble noneism finds with empiricism. One is through the clash of empiricism with noneism. The theoretical reason for the clash is this: empiricism yields the Reference Theory; but the Reference Theory implies existence and transparency requirements incompatible with noneism, and also with noneist positions such as direct realism. A direct simple argument in terms of hallucinations is this: one may see an object which does not in fact exist and know that it does not exist. Such objects, important for direct realism, are anathema to empiricism.

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[1] Including, in a way that *may* provide no sharp separation, the noncontingent statements. The truth definition approach connects naturally, that is, with traditional empiricism, rather than logical empiricism; and it can go along with rejection of the dogma of *logical* empiricism (not of empiricism, as Quine FLP has it) that there is a clear and sharp separation of analytic and synthetic statements.

The argument to the Reference Theory relied on is, in the case of traditional empiricism, in essence this: truth is a matter of experience. Experience is limited to the observational and so the referential. So truth is a matter of reference. Part of the trouble undoubtedly comes from the limitation principle ER. Can things be modified by avoiding ER and not restricting experience? Not without giving away essential features of empiricism. For what is central to empiricism is not experience unqualified, but observational experience referentially construed.[1] The Reference Theory is at the heart of empiricism; and so empiricism fails with the failure of the Reference Theory.

The converse breaks down. The Reference Theory (or complications thereof such as the Double Reference Theory) is part of many positions other than empiricism, e.g. forms of traditional rationalism, platonism (e.g. positions of Plato, Frege and Popper, and other further-realms-beyond-the-empirical positions), marxist and soviet materialism (according to which social classes are real and unanalysable into empirical individuals).

The key feature of empiricism in addition to the Reference Theory is the restriction of initial subjects and predicates to the observable or (more generously but less justifiably) the scientifically given. This restriction is commonly imposed by a definition of existence in terms of what is observable (though this leads to serious difficulties for empiricism over the existence of "theoretical entities") or, according to weakened empiricism, what is scientifically supplied. Indeed the leading features of empiricism can be derived from Reference Theory together with a theory of existence - as to what exists, which is experientially determined, and emerging therefrom, what extensional features entities may have, and how, if at all, entities are related to other objects.

The main argument given against empiricism is but an elaboration, obtained by replacing 'existential judgements' by 'referential statements' of Meinong's argument against empiricism and in favour of its traditional contrast, rationalism: namely

1. Empirical knowledge is confined to existential judgements.
2. The theory of objects furnishes much knowledge not confined to existential judgements.

Therefore 3. Empirical knowledge is not exhaustive of knowledge, and so empiricism is false (cf. Stell). The argument is valid and the premisses are, so it has been argued, true.

But the rationalism so supported is not traditional rationalism (which like empiricism invested in Reference Theory), nor does it imply other theses often cited as those of rationalism, e.g. that reason is the foundation of certainly (OED), that causal connections are necessary connections, etc. Both the traditional contrast between empiricism and rationalism and the usual contrast these days (as presented in elementary textbooks such as Hospers 56) are yet further false contrasts, premissed on a mistaken theory (once again elaborations of the RT).

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[1] In a parallel way, the referential character of science and methodology is fundamental to empiricist conceptions, and invariably insisted upon by empiricists.

Other formulations of empiricism depend upon those already assessed. In particular, it is a corollary of TE that

Every true statement is either analytic or empicical, i.e. there are no synthetic a priori truths; and that

Every statement is either noncontingent or empirical.[1]

For simply define true empirical statements as those conforming to TE, and false empirical statements as those whose negations are true empirical statement. Thus an empirical statement is one which is nonanalytic and whose truth conditions are given at base in terms of pure experience. The counterexamples to TE already indicated apply, for the most part, equally against the corollary.

Judgement empiricism, as so far presented and criticised, is not relativised in any way to individuals, groups, or classes of experiencers. The account criticised is one that begins with observation statements - it matters not whether they are theory-laden or not - and aims to account for all (nonalytic) truth and knowledge in terms of these. The criticisms made apply equally to individualistic theories of knowledge, and to holistic theories of knowledge, such as marxist accounts which present knowledge as a group production of some kind (cf. PT, p.38 ff.). In fact the relativised account, though plainly applicable to the epistemic formulations of empiricism, hardly applies to semantical formulations. For this reason accounts of empiricism that relativise knowledge to types of knowers are insufficiently general, and fail to get at the deeper troubles with empiricism.

The attempt to recast empiricist as an essentially individualistic position is illustrated by the shift Lukes makes (73, p.107) in presenting empiricism as a type of epistemological individualism, according to which 'the source of knowledge is within the individual':

> ... the paradigm epistemological individualist is perhaps the empiricist, who holds that (individual) experience is the source of knowledge, that all knowledge arises within the circle of the individual mind and the sensations it receives (p.117).

Note how 'individual' is first introduced - the introduction is illegitimate - in brackets, and then the bracketing is almost immediately removed and aspects of an indirect account of perception infiltrated. Without these unwarranted shifts Lukes' objections fail to apply against modern presentations of empiricism.

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[1] The theses that (a) Necessary statements say nothing about reality and (b) Analytic statements are trivial and uninformative - sometimes associated with the corollary and often presented as a, or the, thesis of empiricism (e.g. Pap 58, p.91) - neither entail nor are entailed by the corollary. Though indeed theses of logical empiricism, they are consequences of the strict accounts of content and informativeness that logical empiricism has offered, not of TE. The accounts are mistaken, and can be replaced (in a way that has little bearing on TE) by improved accounts; see UL.

A worthwhile survey and critique of the main theses of logical empiricism (including (a) and (b)), especially as they feature in - and dominate the methodology of - mainstream economics, is given in Hollis and Nell 75, especially chapter 1. (The survey is considerably better than the critique which misses some of the main points.)

> The crucial objection to empiricism, and to epistomological individualism generally, has taken two related forms: first, an appeal to a shared public world, and, second, to a shared, 'intersubjective' language, as preconditions or presuppositions of knowledge (p.109).

While these are serious objections to phenomenalism, they carry no weight against empiricism, when empiricism is formulated (as for example by Carnap, Hempel and other logical empiricists, or differently by Armstrong, Mackie and Smart) in terms of the "thing" language, which is public shared language about publicly observable entities. The source experiences of empiricism can, in principle, be public or group.

This procedure of illegitimate redefinition (to suit ideological objectives) is carried much further by Chalmers and Suchting (PT, p.79 ff), who begin, like Lukes, by recharacterising empiricism in individualistic terms, and then extend empiricism so defined, firstly, to include its standard exhaustive contrast, rationalism and, secondly, to include scepticism (or rather Feyerbend and Kuhn). Thus they arrive at their

> ... central and defining characteristic of empiricism .... . Empiricism embraces all epistemologies based on the personal experiences of the individual subject or knowers. This is what is common to all empiricisms (p.36).

Different forms of empiricism are said to result by varying the class of 'experiences', traditional empiricism limiting experience to 'outer' sense experience, rationalism admitting as well certain 'inner' experiences, intuition and the like, and scepticism rendering all experiences 'extensionally subjective'. Neat certainly, but historically and semantically inaccurate. Mainstream characterisations of empiricism make no essential reference to 'personal experiences' or 'individual subjects' (cf. the characterisations given above, the slogan, Hospers, Hempel, TE, etc.). What is at issue vis-a-vis empiricism is not who, what class, the experiences come from or the knowledge accrues to, but the semantic character it has, what are the types of knowledge. Chalmers and Suchting's criticism of empiricism accordingly misfires: as with Lukes, some main targets, such as scientific realists, can easily avoid all fire. Furthermore, when the inaccurate individualistic adjuncts are removed from the characterisation of empiricism, the production theory of knowledge, which Chalmers and Suchting advance (following Althusser), looks, insofar as it can be clearly discerned, very much like a variant on empiricism.

Incorporating individualism into the characterisation of empiricism is not the only piece of redefinition Chalmers and Suchting engage in: they also commit empiricism to a sharp distinction between observational and theoretical knowledge. But, once again, recognition of such a distinction is no part of mainstream accounts of empiricism: it is an optional extra, certainly adopted by many empiricists, but by no means adopted by all, and not essential to empiricism. Here is how the slogan, all knowledge is derived from or ultimately justified by observation, reappears after Chalmers-Suchting transformation (p.30)

> (iv) [and (i)] Theoretical knowledge is derived from or ultimately justified by reference to [what is distinct], basic, untheoretical knowledge [which is observational][1]

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[1] In the case of "rationalism" it includes also intuited knowledge.

> (ii) and (iii) Basic, observational knowledge, [which] does not involve theory, ... is available or given to individual observers (or knowers or subjects).

While empiricism does presuppose some derivation or justificatory machinery, nothing in the characterisation requires that the machinery (which can naturally take the form of a recursive enumeration) incorporates what Chalmers and Suchting have assumed, the idea of a theory-free base in terms of which theoretical knowledge is based. The recursive build-up can be, as with a truth definition (or with empiricist languages), through logical connectives: then nothing about theoretical knowledge or a theory-free base is presupposed. The objections that Chalmers and Suchting make to empiricism on the ground that it includes such a theory/observation distinction,[1] like the objection to empiricism that it assumes an indefensible individualism, is an objection that applies only to certain traditionally important versions of empiricism, but by no means generally.

For empiricism has been progressively widened, and weakened, as stronger forms of the position prove to be untenable. A really pure empiricism, of traditional vintage, would no doubt be phenomenalistic, would begin with theoretically uninfected observations, would be operationalistic, would be nominalistic and individualistic. But such purity renders it difficult or impossible to account for - what empiricism is designed to account for, and to restrict knowledge to - "genuine" scientific knowledge. Scientific realism, acclaimed as a form of empiricism by Armstrong, Smart and others, strikingly illustrates the extent of deviations from purity. Such a position is doubly realistic, in its announced rejection of phenomenalism, and in its (reluctant) rejection of nominalism. It is scientific in its restriction of nonindividuals to those thought necessary for science (usually equated with modern physics); but the position splits over which universals really are required in science - properties (Armstrong, Tooley, ...) or sets (Smart, Quine, ...). But whichever way the position is elaborated, it is mistaken, not only because of its commitment, in common with all empiricism, to the Reference Theory, but because its enlargement of purer empiricism to include certain universals commits it to the existence of objects which do not exist. There is a further serious weakness confronting such impure empiricism, namely in the explication of the derivability relation $\underset{\sim}{R}$. How, in particular, are statements about universals and their interrelations to be accommodated, without exceeding empiricist bases in experience?[2] Scientific realism has given no satisfactory answer. It is unsatisfactory to appeal back to science - all that has so far been offered - for science may (indeed does, so it will be argued) transgress empiricist, and referential, restrictions.

Pure (or fair dinkum) empiricism, that is empiricism which adopts - what would be expected with empiricism - an observational criterion of existence, avoids or mitigates several of these problems for scientific realism (though not without heavy costs when it comes to showing science empirical). Pure empiricism does furthermore what critics such as Lukes and Suchting expect of empiricism, limits objects to individuals, since only individuals (in a wide sense) are observable objects. Pure empiricism, that is, implies individualism, and is accordingly open to criticism on that score. In short, although empiricism need not involve individualism in the way common supposed - neither scientific realism nor marxist materialism do so - empiricism does yield individualism given characterisations of existence of the type which it itself typically supplies and tends to force, that is characterisations in terms of observability (so leading into §12).

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[1] In chapter 11 Chalmers' case for rejecting this distinction is examined and rejected.

[2] There is a parallel problem for concept empiricism. What is the derivation relation by which universals derive from experience? And how can such a relation conform to the demands of empiricism? In concept terms, it is easy to see how far scientific realists are removed from the traditional empiricism of Locke, Berkeley and Hume.

§11. *An interlude on the destruction of mathematics by scientific realism.* Scientific realism comes in different varieties, differently packaged. Any variety that conforms to usual nominalism - the position to which empiricisms naturally tend - is, as is well-known, very destructive of mathematics: most of it is removed with other non-nominalistically-accountable-for rubbish. Modern scientific realism departs from usual nominalism just far enough, such at least is the intention, to enable "science" (meaning usually, entrenched physics) to function: the rest is dismissed with various grades of scorn or abuse that change over the years as empiricism changes its garb. The rest includes, however, a good deal of mathematics and logic. For what enables science to function (its discourse to be significant, some of its theses true, etc.) does not enable many branches of mathematics to function. Just how destructive of mathematics modern scientific realism can be will be brought out by considering Armstrong's new variety (of 78).[1]

Given empiricist principles, no properties or relations can be shown to exist by (purely) a priori methods (Armstrong 78, II, pp.7-8). Since pure mathematical relations are typically determined a priori and much of mathematics revolves around the logic of relations, Armstrong's empiricist principles have an immediate and devastating effect on mathematics. Some examples will illustrate the extent of the damage. Firstly, no relations are reflexive (see the detail of 8.10), and hence no relations are equivalence relations (i.e. reflexive, symmetric and transitive). But many important mathematical constructions depend upon the formulation of equivalence classes, or partitioning by equivalence relations. Familiar constructions of the higher numbers such as negative, rational and complex numbers all proceed in this way. Armstrong is committed to the rejection of all these constructions using equivalence relations by his effective rejetion of reflexive relations (78, II, p.143)

> ... we rejected the view that there can be states of affairs having the form Raa. In consistency, it seems that we must deny states of affairs having the form R(P,P), where R is a higher-order relation relating a property (or a relation) to itself.

So far Armstrong's theory has not even delivered a minimal account of the non-negative integers which satisfies the Peano postulates (cf. 78, p.73). Unremarkably, Armstrong hopes that the account he sketches of natural numbers in terms of possible structural properties can be carried through, but even this is in doubt for two reasons; firstly it is unclear (once the 'possible' is duly removed from 'possible structural properties') that enough properties will exist; and, secondly, since unions cannot be generally formed (as disjunctive universals are rejected) addition and multiplication will not be everywhere defined. Beyond the positive integers, the situation is even worse. An account of negative integers, in terms of properties, appears ruled out entirely, because of Armstrong's rejection of negative properties. In a similar way property analogues of those central parts of modern mathematics, the algebra of classes and relations and Boolean algebras, are ruled out by the rejection of negative and disjunctive universals; modern mathematics is crippled. With analysis the situation is worse again: the theory eliminates all the usual means of defining the central notions and proving the fundamental theorems. Is this really "scientific realism", which destroys much of pure science and also substantial parts of theoretical science which applies mathematics?

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[1] The trouble with Smart's impure scientific realism - impure because it appears to admit a good many classes not needed in science - has already been considered briefly in 8.8.

In contrast to scientific realism, noneism can account for all of mathematics, without ontological commitment (see chapters 10 and 11).

§12. *The roots of individualism, the strengthened Reference Theory of traditional logical theory, and the rejection of individual reductionism and holistic reductionism, and of analysis and holism as general methods in philosophy.* Individualism divides, in terms of disciplines, into economic individualism, political individualism, ethical individualism and epistemological individualism (for such a classification see Lukes 73, where the various disciplinary-confined positions are described); and readily extends to other disciplines, e.g. logical individualism, physical individualism, biological individualism, psychological individualism, etc. etc. - the proliferation indicating a failure to get to essentials. For behind all these positions runs a common theme (you guessed it again), the Reference Theory as circumscribed by a characterisation of existence which limits what exists at least to individuals. That is, the common assumption is that truth, and also knowledge and meaning [in each discipline], is a matter of, and so reduces to (transparent features of), individual entities [recognised by the given discipline].

It is often supposed that empiricism or positivism is the source of individualism of various sorts, in particular of what may be called individual reductionism, according to which everything resolves into individuals, a little more exactly is a logical construction - using abstract classes if need be, so the position may be wider than conventional nominalism - from (abstract) individuals of a given sort. This strikes close to the mark, and calls for but minor qualification and some clarification of the sorts. Though pure empiricism does indeed yield empirical individualism - what is often called theoretical individualism - it is not required for a wider, but equally insidious, position, referential individualism, according to which objects have no features other than those that are constructions from referential (extensional) features of individual entities. This form of individualism - narrow forms of which are at the base of the discipline-confined positions - is sufficient to wreak most of the intellectual damage that has been attributed to theoretical individualism. It is moreover open to many of the objections that have been lodged against theoretical individualism (for some of these see J. Burnheim in PT). The classical characterisation of theoretical individualism, in the context of social theory was given by Mill:

> Human beings in society have no properties but those which are derived from and may be resolved into the laws of nature of individual man (47, p.575).

The basis, to which all other features are resolved, comprises individuals and their empirical features, since laws of nature were exclusively empirical according to Mill. Extend the thesis beyond social theory to all entities, and empiricist individualism is the result. Intensional relations, such as social interrelations, dissolve under the reduction. Examples are all too familiar: not only society but all social organisations are logical constructions from individuals comprising them and certain of their extensional features. Thus economics is a matter of individuals with certain revealed preferences and with private interests (which translate into profit and other maximization motives); value reduces to certain extensional features of individuals (without constraining relations between them); hence the genesis of political individualisms, classical economics, and utilitarianisms.[1]

The drive to remove intensional and inexistential features that leads in social theory to the socially-impoverished private individuals of classical and neo-classical economic theory and to the self-contained and isolated individuals of "liberal" political theories, is fundamentally the same drive as that which leads, when followed through, to the pure atomic entities of classical logical theory, to the ideas of traditional epistemology, and also to the disinfected epistemological objects of fair-dinkum empiricism and of scientific realism which are stripped of all intensionally-affected internal relations, and also perhaps of secondary qualities. The differences lie in the sorts of basic entities admitted, which turns on the sorts of features the entities (are allowed to) have. The crucial point is that an individualist position may restrict features of individual entities to a narrow subclass of transparent attributes: thus, for example, Mill's restriction to empirical properties; the limitation in leading versions of scientific realism to primary qualities; the reduction of economic individuals to entities with only certain preference ranking on commodities; etc.

A striking example of the restriction of features well within referentially required limitations is provided by traditional empiricism, which excludes all but a very few of the relations in which objects can stand, as not features of entities or as at best derivative features (see, e.g., Hume's sparse list of relations 'comprised under seven general heads' in 1888, pp.14-15). Indeed, the restrictions result in what may well be called the Strengthened (or Traditional) Reference Theory (STR) of traditional empiricism.[2] The Strengthened Theory arises primarily from the combination of the Reference Theory with the assumption of traditional logic that every judgement can be (adequately) represented in subject-predicate form - an assumption that had a disastrous effect on metaphysics and so on the remainder of philosophy. As to the effect consider, for instance, the impact of Brentano's thesis that all judgements are existential in form, either assertions of existence, "There exists an S which is P", or denials of existence, "There does not exist an S which is P", a thesis obtained by reducing subject-predicate forms syllogistically represented to particular forms and applying the Ontological Assumption. The thesis rendered impossible a satisfactory theory, not only of relations, but of the nonexistent, of fictions, and even had a damaging effect on Meinong's theory of values, in the assumption that values and 'value-feelings are all cases of concern with existence and nonexistence' (Findlay 63, pp. 267-8). A more familiar example is provided by the striking impact of Kant's assumptions as to the completeness of various of his classifications (e.g. of categories) on his philosophy.

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[1] It is a short route from referential individualism, as based on the strengthened Reference Theory, to capitalism. But the route runs through the foundations of economics and exceeds even the bound of this venture (see, however, for some of the route, ENP). Very briefly, such referential individualism involves the reduction of knowledge, skills and technology and more generally of the means of production to individual, and monopolisable, products, which however - the exclusive individual control of the means of production - is the genesis of capitalism.

[2] It could be alternatively said, perhaps less accurately, that it is not so much that the Reference Theory is strengthened as that, in applications, the Theory - because of narrow construal of referents - becomes more powerful and destructive.

According to the Strengthened Reference Theory, the truth of statement A, which is of the form 'ξf' (the subject may be plural, as in 'Men are always mortal') is a function [just] of the reference of 'ξ' (e.g. men). Thus the truth - and similarly knowledge and meaning - of A is independent of anything but the reference of 'ξ', and can be determined just through ξ without considering anything else. Relations between entities (individuals or aggregates) thus have none but a derived role. It is for this underlying reason that relations vanish, and have to vanish, into complex properties, as for instance in Hume's theory into complex ideas, namely mental comparisons (properties of minds) of qualities of objects (1888, pp.13-15). Hence too the prejudice against relations, observed by Russell 1896 and more recently be Austin (61, p.18):

> A pretty anthology might be compiled of the phrases found by philosophers to express their distrust and contempt of relations: 'entia semi-mentalia' and what not. I suppose it goes back to Aristotle, who assumes, with the plain man, that 'what is real is things', and then adds, grudgingly, 'also their qualities', these being somehow inseparable from things: but he draws the line at relations, which are really too flimsy. I doubt if there is much more behind the prejudice against relations than this: there was not in Leibnitz's case, and few have hammered relations as hard as he.

But certainly there was much more behind it: the whole weight of traditional logic in combination with the Reference Theory, which obtained almost classic form in Leibnitz's case. This accounts too for the prejudice being seriously weakened, and becoming visible, with the replacement of traditional logic by classical logic which incorporated the Boole-Schroder algebra of relations and Russell's theory of relations.[1]

What emerges from the Strengthened Reference Theory is a picture of separate entities, with certain referential properties, but not interconnected. It is the picture not only enforced through traditional logic, but adopted, with considerable initial success, in classical physics, where

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[1] There was, however, another, likewise referential, influence which may have been at work in Aristotle's theory and certainly figures in modern antipathy to relations. It is this: immanent theories of universals, such as Aristotle's, which locate the universal in each thing which instantiates it, lose much of their appeal when applied to relations, which have to be shared out between two or more things in each instance. For example, north of can be located neither in Edinburgh nor London, but has

[1](Footnote continued on next page)

the basic units, from which all else is supposed to be constructed, comprise elementary particles which have just a small number of primary properties, mass, position, velocity (vector). Position - like time in terms of which velocity and acceleration were assessed - was construed as a property, as an absolute theory of space permits. Moreover, the basic interaction relation on this model, collision, could be construed, through juxtaposition, in terms of properties. Into this pretty picture, which served to explain many physical phenomena, gravitational relations did not fit, despite repeated efforts to reduce them.[1] Nor, it eventually turned out, was gravitation the only problem. The theory of solids could not be included either, as Boscovitch showed. Any by the end of the nineteenth century it was evident that much else could not be accommodated.

The success of classical particle physics (despite the outstanding problems of gravitation, of solid bodies, etc.) together with the philosophical reinforcement of its methods meant that every other science, or putative science, would be launched upon a similar individual reductionist research programme. And so for the most part they were, and within that unfortunate pattern they have remained largely locked, though the holistic heritage from nineteenth century German philosophy has had some, but a relatively minor, influence in the social sciences, and more recently in the biological sciences. In particular, under the method copied (though quite inappropriately) from classical physics, copied with the encouragement of positivists and empiricists from Bacon and Hobbes, on through Comte and the Mills, we arrive at social sciences based on private self-contained individuals units (e.g. the firm, the nuclear family) whose interests and revealed preferences are egoistic - at a fragmented world of self-interested referents with their approved empirical properties. Instead of colliding, they compete, a model also imposed on evolutionary biology; they are not interrelated nor do they cooperate unless such relations can be reduced to properties in their own respective self-interests; and even the apparent relation of competition is eliminated by such devices as the capitalist market, where each individual unit simply buys or sell commodities or factors anonymously, and relations dissolve - it is all well regulated without relations, as if by an "invisible hand".

The classical physical picture, which proved inadequate in the case of physics itself, has not really been abandoned in the social sciences where it continued to flourish. Nor has the change in the physical picture been sufficiently far-reaching: the introduction of fields forced by electromagnetic phenomena need involve no more than the assignment of extensional relations between referents, so it represents logically only an advance from traditional logic, and does not really move beyond the confines of classical logic. But, by and large, the social sciences have not even advanced this far. Nor it the inclusion just of extensional relations within the physical picture sufficient (as will be argued in the next chapters): how less adequate then would such a shift be in more highly intensional sciences such as social sciences. Furthermore, with a change of framework, various of the "conceptual difficulties" of

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[1] (Footnote continued from previous page)
somehow to be assigned to the ordered pair <Edinburgh, London>, considerably complicating the theory and committing it to a (rudimentary) theory of classes.

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[1] See, e.g., the discussion of the corpusular philosophy in Harré 72.

quantum and relativistic physics and their combinations, which appear to be primarily problems generated by the transference of much of the classical physical picture, can be expected to dissipate.

These referential pictures at the base of mainstream modern sciences are no more satisfactory than the Reference Theories which they presuppose, and fail for the same reason. In particular, since the Strengthened Reference Theory entails the Reference Theory, it is refuted with the Reference Theory, and the case marshalled against the latter applies against it, along with the arguments of Russell and others against attempts to eliminate relations (especially Russell's early logical work). It is a serious but common error to jump from the failure of individual reductionism as a general method to some sort of holistic position (as do, e.g., Lukes 73, Chalmers and Suchting in PT, and many marxists). Holistic reductionism is no more satisfactory than individualistic reductionism, but rather the dual of it and open to essentially the same style of objection (see ENP). The correct position, emerging from noneism is a nonreductionist position which includes both individuals and (social or biological) wholes, neither of which reduce, in general, to the other.

An interesting example, within philosophy, of the false dichotomy between individualism and holism concerns the conflict between analytic methods of empiricist-inclined philosophies (including "ordinary language" philosophy and pragmatism) and holistic methods of leading continental philosophies. The method of analysis supposes that an item or notion can be taken in isolation and its nature revealed by exposure, in one way or another, of its components, that an item may be characterised purely on its own independently of its network of relations to other items (and its place in the whole, as holists would say). The assumption that analysis can always succeed is premissed on stronger versions of the Reference Theory, that all truth about an object is characterised internally and cannot be characterised through its relations. And analysis fails generally as a method with the failure of the Reference Theory.

The general failure of the method does not imply that is cannot often succeed. To draw such a conclusion would be to accept the false dichotomy frequently offered between separable individuals on the one side and nonanalysable wholes on the other, and to omit consideration of richly-attributed individual items which fall outside the dichotomy and break it (see further ENP). Analysis can sometimes succeed, objects can be considered in isolation, because they have as well as relations, properties of their own, which make them distinct individuals. (The more general rejection of analysis as a method, that no thing can be considered in isolation from the totality to which it belongs, depends on rejection of such basic, and correct, logical principles as A & B → A. Truths about a whole imply truths about parts which can be separately assessed.)

§13. *Emerging world hypotheses: qualified naturalism, qualified nominalism and the rejection of physicalism and materialism.* The account of existence given is an almost minimal one. Nothing exists but particulars - just as nominalism says. The only controversial objects admitted under the synthesized criteria for existence are microentities and complexes and aggregates; but the latter can hardly be avoided given that all their parts exist. All the particulars that exist are spatially locatable. Then, for appropriate senses of the ambiguous term 'world', the following are true:-

(1) The world contains nothing but particulars;
(2) The world is nothing but a single (all embracing) spatio-temporal system.

Thesis (1) is what Armstrong (78, p.147) calls 'the nominalist world hypothesis'[1], and thesis (2) he calls 'the hypothesis of "Naturalism"'. Both (1) and (2) concern the world as the totality of *entities* - not objects, at least in so far as they are true - but concern it differently, (2) implying certain interrelations of the elements of the world. Thus (1) can be more accurately expressed in terms of the entity domain e($\underline{\underline{T}}$) of the real world $\underline{\underline{T}}$, as

1R. Every element of e($\underline{\underline{T}}$) is a particular,

i.e. more simply, in English, every thing that exists is particular.[2]

But nominalism and naturalism as usually understood - both of which are referentially-based, assuming at least the OA, and typically the IIA as well - discern no distinction between objects and entities. According to nominalism,

OR. *Every object is an entity* (the *object reduction thesis*)[3]

whence, since every entity is an object, d($\underline{\underline{T}}$) = e($\underline{\underline{T}}$). Hence, too the usual nominalist thesis

1N. Every element of d($\underline{\underline{T}}$) is a particular,

i.e. every object is a particular. Thus appropriate expansions of 'world', as a totality of objects versus a totality of what exists, separate noneism from (usual) nominalism - and similarly from naturalism. While 1R is true (and argued for in previous sections), OR and 1N are both false (and many counterexamples have been given). The qualified nominalism of noneism (the nominalism of p.11) is that (acclaimedly true) position which asserts 1R but, rejects OR and 1N .

By contrast, Armstrong (78, p.126 ff) rejects thesis (1), and both theses 1R and 1N , in favour of his own hypothesis (of Aristotelian realism), namely

1A. The world contains nothing but particulars having properties and related to each other.

Here "the world" is either e($\underline{\underline{T}}$) or d($\underline{\underline{T}}$): on Armstrong's philosophy they coincide. The domain e($\underline{\underline{T}}$) contains, according to Armstrong, as well as particulars, attributes (those fully instantiated by sometime-existents of e($\underline{\underline{T}}$) and also crucially - though the form 1A does not allow for it, a *serious* omission - certain properties of the relations relating these properties and relations, i.e. certain higher-order attributes, such as causation and lawlike connection which are said to be relations of properties and relations. Even if higher order attributes are excluded, Armstrong is obliged to reject his hypothesis 1A, on pain of inconsistency otherwise. According to Armstrong's version of realism, certain properties and relations exist. By the Grand Dilemma (the main argument of 77 and the final chapter of 78, vol.1, with the examination of which much of this section will be concerned), these attributes must be spatio-temporal objects. This is problematic enough, as will emerge. But worse, attributes are not particulars, yet by thesis 1A , only particulars having attributes exist, so attributes do not exist. Thesis 1A will have to be abandoned if Armstrong's realism is accepted. The trouble can be located alternatively, without appeal to the fallacious Grand Dilemma, as follows:- If a particular exists having properties, then by the Ontological Assumption, the properties exist. But these properties are universals, not particulars (or particulars having properties), so 1A is false.

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[1] At least he calls it this when the apparently redundant (since the nominalist does not mean 'bare particulars') proviso, 'particulars which are nothing but particulars', is added. The proviso is not included in his earlier exposition 77, but is no doubt added with a view to separating nominalism from his own position which takes particulars as the bearers of properties and relations. Noneism accepts both thesis (1) *and* the thesis, 1A below, that Armstrong contrasts with (1).

[2] Once again, in presenting universally formulated theses of nominalism, we have trangressed - as we may - the limits of usual nominalist discourse.

[3] In what follows in this section e($\underline{\underline{T}}$) is generally to be construed as the domain of *sometime*-existents.

Thesis 1A only contrasts with (1), i.e. 1R , in the way Armstrong supposes given the referential assumption (an instance of the OA) that the having of properties and relations implies the existence of the attributes thereby attributed. It does not. Particulars have properties much as some individuals have minds. That does not imply that properties exist, any more than the having of minds implies minds exist, or having of second thoughts implies that second thoughts exist: having is not a Brentano-style relation. 1R and 1A are accordingly reconciled in noneism: both are true. Even so no attributes exist, or can be legitimately included in e($\underline{\underline{T}}$). So much is scarcely news; but little has been said heretofore on naturalism, materialism and physicalism.

Naturalism, like nominalism, decomposes under noneist scrutiny into different theses, some of which are acceptable, and some of which are not. The situation is also complicated by competing characterisations of naturalism. Consider first thesis (2), which, insofar as it is correct, says that the elements of e($\underline{\underline{T}}$) comprise a single spatio-temporal system, i.e.

2R. Everything that (sometime-) exists is an element of a single spatio-temporal system.

Just as the having of properties by particulars does not imply the existence of properties, so the belonging of entities to a spatial-temporal system does not imply that this spatio-temporal system exists, i.e. is real (in one sense of that term). Whether the spatio-temporal system exists depends on how 'spatio-temporal system' is construed; and the same holds for the world (e.g. the actual world construed as the set of true propositions does not exist). If the spatio-temporal system is a relational structure of a certain sort, representable as a set carrying relations, it is an abstract object, and so does not exist. If however the spatio-temporal system is simply the aggregate of sometime-entities in their spatio-temporal relations then it is a complex object, which does exist. The usual nominalist, if he asserts thesis (2) is committed to a construal of the latter sort. For (2) implies, by the OA, that the spatial temporal system exists, and therefore that the world exists, and were the system an abstract object nominalism would be contradicted. To say that the spatio-temporal system, construed as an abstract object, does not exist, is not real, is not to say that it is illusory (Armstrong's suggestion, 77, pp.411-2). 'Illusory' is only of the one contrasts with 'real': another somewhat more satisfactory contrast is 'ideal'.

Thesis 2R is a thesis about what sometime-exists, and it follows from the account given of existence.[1] Thus, while it is controversial, it is no more so than the account of existence. But naturalists usually intend to assert, with (2), a much stronger and more controversial thesis than simply 2R - indeed one which would put an end to theories of objects - namely the d($\underline{\underline{T}}$)-version of (2),

2A. Every object is an element of a single spatio-temporal system.

But of course, given the object reduction thesis OR , they do not distinguish 2A from 2R .[2]

As a result they are at once committed to an enormous reduction programme, of all those objects which they are forced to admit (by the Ontological Assumption) exist, but which do not conform to 2A , to entities which do conform to 2A . Moreover, almost every stage of the reductions proposed thus far look shaky, at least to philosophers not committed to 2A . In advance, however, of satisfactory reductions usual naturalists are in serious difficulties in stating and defending their theses (these difficulties are exacerbated in the case of materialism and physicalism, next stages of advance beyond naturalism, which countenance even narrower classes of objects). These difficulties are a generalisation of the problem of negative existentials (and also reminiscent of problems in stating type theory). In trying to show that objects outside their scheme of things do not exist, usual naturalists (and physicalists) appeal to features of these objects, e.g. that they do (or do not) interact with spatio-temporal entities: yet if the objects do have these features used in refutations of them then they exist (by the OA), and accordingly falsify usual naturalist theses. Furthermore, in stating their position usual naturalists make use of objects, such as propositions and the like, which their theses do not admit; similarly in defending their position they make use of further objects, namely arguments and principles (e.g. Occam's razor, the verification principle) beyond their scheme of entities. For example, Armstrong, whose world, by 1A , contains no propositions states his position propositionally, and goes on to defend it by appeal to principles like Occam's razor, and by a priori argumentation, though 'as an Empiricist ... [he] rejects the whole conception of establishing such results by a priori argumentation' (77, p.412).[3]

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[1] It is not a thesis of geometry, though it gives a small piece of information about the geometry on e($\underline{\underline{T}}$). Still less is it a claim that a reduction to spatio-temporal features can be effected. Even as regards physical properties such a thesis is false - unless the dubious thesis of geometrodynamics should be correct. For the sometime-existent spatio-temporal objects also have many physical properties and behave in ways governed by physical laws: there is much more to the spatio-temporal world of entities than Minkowski geometry.

[2] This is evident enough in Armstrong, who accounts nonexistent objects entities, i.e. things that (are postulated) to exist (77, p.412, p.417).

Once again the Ontological Assumption lies behind this equation, behind OR . The use of the OA is quite conspicuous in Armstrong's work, and has already been remarked upon. To give just one more, relevant, example (from 77, p.412); Men and other organisms have purposes: this is a plain matter of fact. Therefore, Armstrong infers, without even noticing the transition, purposes exists, also as a plain matter of fact. Hence the problem for usual naturalists of trying to give an account of purposes within the confines of 2R .

[3] Armstrong is well aware of these difficulties for his position (see 77, 'Remarks read at the conference'), but suggests no resolutions of them (in 77 the problem

[3](Footnote continued on next page.)

Armstrong's way of trying to dispose of objects beyond the pale, without attributing any properties to them, is in fact through intensional coverage of statements apparently about them.[1] Philosophers postulate such and such objects in addition to those usual naturalism allows: but it is implausible to do so, and there are severe difficulties in doing so.[2] The list of objects philosophers are said to postulate that naturalism excludes is long: here is part of Armstrong's list:

> ... philosophers and others have postulated a bewildering variety of additional entities. Most doctrines of God place him beyond space and time. Then there are transcendent universals, the realm of numbers, transcendent standards of value, timeless propositions, non-existent objects such as the golden mountain, possibilities over and above actualities ("possible worlds"), and "abstract" classes, including that most dilute of all entities: the null class (77, p.413).

But

> despite the incredible diversity of these postulations, it seems that the Naturalist can advance a single, very powerful, line of argument which is a difficulty for them all (77, p.413).

This argument is the Grand Dilemma:

> Are these [objects], or are they not, capable of action upon the spatio-temporal system? Do these [objects], or do they not, act in nature? (77, p.413; but Armstrong has 'entities' where 'objects' has been inserted, to avoid prejudice).

The way the theory of items will meet this dilemma, which threatens it too when the argument is tightened up, is, to begin with: 'it depends, in particular, on how the relation of acting on is spelt out, e.g. whether it is an entire physical relation or a causal relation or what', and then: 'Some do and some do not'.

Consider, first, the horn of the dilemma where it is assumed that objects do not act in nature (Armstrong's 'blazing fire', which he advises anti-naturalists not to try). Since nonentities do not physically act

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[3] (Footnote continued from previous page)

is likened to Wittgenstein's problem in the Tractatus, and left at that). Smart has however, in 78, faced the difficulties, in the case of physicalism, and attempted to take the obvious way out, a physicalist reduction of the theses of physicalism. (The obvious way is really the only way, a Tractorian throwing away of the theory after it was reached by means exceeding the theory would never do; nor would exceeding what physicalism countances at some metalevel). But the reduction proposals Smart outlines are singularly unconvincing, and unpromising: we have seen too many times before how and where such proposals break down.

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[1] In the course of the arguments the intensional covers slip off; but at the cost of considerable complication in statement and a (desirable) increase in exactitude the covers would, perhaps, be restored.

[2] Which necessitates in turn further reductions: the theses are implausible, have difficulties; so implausibilities and difficulties exist, but not in any way obvious way in space-time, so reductive analysis is inevitable.

upon entities[1] it is this horn that has, it seems, to be faced at least in the case of possibilia, possible worlds, and the like. The argument is said to be simply this:

> If any [objects] outside the [spatio-temporal] system
> are postulated, but have no effect on the system[2]
> there is no compelling reason to postulate them.
> Occam's razor then enjoins us not to postulate them
> (77, p.415).

There are two steps that maybe faulted in this argument, and both should be faulted: namely

(a) there is no compelling reason [theoretical necessity] to postulate objects (such as nonexistent objects) which do not physically act upon spatio-temporal entities.

(b) One ought not (or whatever other injunction Occam's razor is taken to include) to postulate objects for which there is no compelling reason [theoretical necessity].

Step (b), Occam's razor, has already been criticised (early in chapter 3), as being a referentially-based principle (e.g. it presupposes OR), which incorporates various muddles, especially the assumption deriving from the OA that what one chooses to talk about or include in one's theories has an important bearing on what exists. But there is a point in examining the middle term of the argument and its key expressions 'postulate' and 'compelling reason', to ensure that equivocation, upon which Armstrong's argument does rely, is removed. Armstrong undoubtedly means by 'postulate', 'take (postulate) to exist' but in that sense, his case falls on its face against anti-naturalists such as noneists who do not take nonexistent objects to exist; for these philosophers do not postulate any objects beyond those naturalism postulates. Let us instead employ 'postulate' in its ordinary neutral sense, 'take for granted' (see OED). Objects including propositions may be taken for granted whether or not proof or argument can be supplied; what does not exist may be similarly taken for granted. Postulation is an intensional inexistential relation. Consider the special form: x postulates that A, x Pt A for short, then the relation is intensional in the second place, since x Pt A and A ≡ B do not imply x Pt B. And the relation is inexistential because x Pt yf does not imply yE. Further "x postulates ys" and "x postulates ys to exist" (equivalently, x Pt ys exist) are not equivalent. For compare "Meinong postulates nonentities", which is true (in the take-for-granted sense), and "Meinong postulates nonentities to exist", which is false (in the same sense of 'postulates').

But now, what is wrong with taking for granted, for one purpose or another, objects for which there is no compelling reason or no theoretical need (e.g. esoteric mathematical objects or assumptions, for reasons of entertainment)? Nothing, it seems, at all. (b) is mistaken. There is good reason, however, for taking for granted many of the objects a theory of objects includes (much of this book has consisted of a presentation of these reasons). Whether these reasons are compelling is another matter (in one sense there is nothing compelling about working out philosophical or other, theories, a sense that converts Occam's razor, (b), into a complete theoretical annilitator): but philosophers as various as Bentham and Vaihinger, Reid and Meinong have thought they were compelling. But replace 'compelling reason' by - what Occam's razor in its more customary, and less unsatisfactory formulation would have - 'necessity', meaning 'theoretical necessity',[1] and the noneist claim is that many of the objects it takes for granted are theoretically necessary, in a range of theoretical disciplines; that is, (a) so formulated is false.

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[1] In the relevant entire sense. The issue of reduced relations falls under the other horn.

[2] Note, what will become important subsequently, the shift to causal talk of 'effects'.

The weakness of the "simple" argument quickly becomes apparent when mathematical objects, such as numbers, are considered. They are not elements of the spatial-temporal system and they do not act physically upon it or its elements; but they are theoretically indispensible and there is excellent reason to postulate them (or, better, define them). Armstrong has reserve arguments designed with the object of removing such countercases. He is worried by fashionable pragmatist justifications of abstract objects, such as abstract classes (Armstrong's bête noire): briefly classes are necessary for mathematics which is necessary for physics, so classes are required 'to explain the workings of nature'.[2] But mathematical objects such as classes

> do not bring about anything physical in the way that genes and electrons do. In what way then can they help to explain the behaviour of physical things? (77, p.416)

Armstrong suggests that 'they explain nothing' unless they are endowed with 'this-worldly powers', that

> we must insist ... that statements about possibilities, numbers, classes, etc. be given a this-worldly interpretation (77, pp.416-7),

i.e., strictly, a naturalist interpretation. Firstly, this argument from lack of explanatory power conflates explanation with causal explanation, explanatory power with causal power.[3] While ideal nonexistent objects, for example, lack causal power, they may possess explanatory power. Ideal objects of physical models do not bring about anything physical (they are physically powerless), but they are of much importance in explaining the behaviour of physical things. This is possible because, secondly, explanation is not a Brentano-style relation and so can truly relate what does not exist to what does. Thus too ideal objects can explain much even though they are not endowed with this-worldly power in the narrow sense Armstrong intends (which excludes classes as this-worldly objects.) It is simply false, then, that objects outside the usual naturalist ken, and irreducible to it, can explain nothing actual. They can, and do, explain much concerning the natural world, and given the character of explanatory relations, no naturalistic interpretation is required. A consequence is that the following corollary Armstrong draws by no means ensues:

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[1] Or, alternatively, as Armstrong himself subsequently puts it, 'intellectual necessity'.

[2] In fact only a relatively small part of mathematics, and of class theory, is required for these purposes: recall chapter 8 §4. Without a restriction of mathematics to some physical-required part there is, by Tarski's theorem as explained below in the text, no (classical) prospect of doing what Armstrong thinks must be possible, giving 'an explanation of the truth-conditions of mathematical statements purely in terms of the physical phenomena which they apply to' (77, p.416).

[3] This conflation appears to be systematic in Armstrong 77 and 78; in particular it figures also in the other horn of the Grand Dilemma. A related systemic error is the assumption that all relations are Brentano-style relations, that if x exists and y is related to x (or x to y) then y exists. Thus it is regularly assumed that if x explains, or has explanatory power as regards y, which exists, then x is causally related to y, and related to y by a physical causal relation (physically acts on y), so x exists. The assumptions are all mistaken.

> ... there surely must be [a naturalistic] account [i.e. interpretation, of the statements of mathematics]. The incredible usefulness of mathematics in reasoning about nature seems to guarantee this (p.417).

It affords no such guarantee; for the usefulness does not result from Brentano-style relations such as those of physical action or causal power. A theory is not in general reducible to, or interpretable just in terms of, the data it explains. In particular, an interpretation of the statements of mathematics, which would include a truth definition for mathematics,[1] cannot be given in the usual naturalistic terms with a domain merely of spatio-temporal entities. For such an interpretation would include a truth definition for analysis (so far the most useful part of mathematics for physics). But by limitative theorems (the general Tarski theorem) such a definition cannot be classically expressed within analysis. Analysis is not exceeded however in its resources by the naturalistic domain (the spatio-temporal manifold is of no greater power than the real line). Thus a truth definition for analysis cannot be naturalistically supplied (since the logic of usual naturalism is classical), and hence an interpretation of mathematics in usual naturalistic terms is impossible.

The conflation of different sorts of power persists in Armstrong's final reserve argument, which relies on the following principle

> ESM. if a thing lacks any power, if it has no possible effects, then, although it may exist, one can never have any good reason to believe that it exists (77, p.417).

The argument is this: if objects do not act on or in the spatio-temporal system, then they lack power; hence by ESM there is never any good reason to believe they exist. Or, in Armstrong's more sweeping form:

> if it is only spatio-temporal things that have power, the principle bids us postulate no other realities (p.417).

The argument carries no weight against a theory of objects or against an existence-free mathematics, since existence of relevant objects is not postulated. Indeed noneism can adopt the stronger principle,

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[1] An interpretation is intended as a semantic interpretation which includes an explanation of truth-conditions: see 77, p.416.

Of course, by Skolem-Lowenheim theorems interpretations of mathematics over naturalistic domains can be provided, given (what is however doubtful) that there are denumerably many spatio-temporal entities. But a Skolem-Lowenheim theorem is insufficient for naturalistic-reductionist purposes; for the interpretation has to be given in naturalistic terms, so the truth definition must be included within the theory.

ES. if an object lacks (physical) power then it does not exist,

of the Eleatic Stranger, from which Armstrong obtains ESM, provided that the requisite qualification of power to physical power, i.e. ability to act physically, is imposed. For if an object exists then it stands in entire spatial and physical relations to other entities. In short, the argument supports qualified naturalism.

But both principles fail where both power is construed as explanatory power (or theoretical power), and effects correspondingly as consequences, and the Ontological Assumption is accepted (as by Armstrong). For ideal objects and mathematical models, for instance have explanatory power; hence they have (at least through their consequences) properties, and so, by the OA, they exist. Accordingly Armstrong's reserve argument fails against most important opponents, those who peddle fashionable pragmatist justifications of the existence of mathematical objects, provided they take the elementary precaution of distinguishing physical and explanatory power.

The Grand Dilemma does not then establish its intended conclusion; in particular, it works neither against noneists nor against others such as pragmatists. It fails because one horn of the dilemma fails. The other horn of the dilemma is worth exploring briefly. For while one of the main points can be picked up in the discussion of the case made out for physicalism where the dilemma is repeated, namely the 'appeal to natural science', still the interesting complexities of the relation of acting upon are there submerged.[1] The horn concerned is produced by the assumption that transcendent objects act upon the spatio-temporal system. There are, Armstrong argues, logical and conceptual difficulties about such relations, indeed there are difficulties about transcendent objects having any relations at all to spatio-temporal particulars. The latter is, as we have seen, not so: despite Brentano and Parmenides, many relations between higher order objects (and nonentities more generally) and spatiotemporal particulars are unproblematic, e.g. Armstrong belongs to various abstract sets, has various properties, is the object of sundry propositions, quantum theory explains black bodies, etc. The relations Armstrong is chiefly puzzled by are action relations of a causal sort.[2] How, he inquires, can a transcendent object have causal power? How can it, as an unchanging object, or as an object outside the spatio-temporal network, work causally in the world or effect change? Armstrong anticipates negative answers, but prematurely. What becomes apparent is that Armstrong is operating throughout with a severely restricted notion of cause, which rules out many of the connections that would ordinarily count as causal. Given these connections the question to which he anticipates the answers 'It can't', 'they can't', obtain positive answers. On the face of it, all the following sorts of transcendent objects can stand in causal relations: objectives, states of affairs, propositions, properties, universals. Consider a few examples: 'The chair's being exposed to sunlight caused it to fade', 'That the cover was vinyl accounted for its deterioration', 'The proposition caused much discussion', 'Wetness causes fungal rots', 'Poverty caused their suffering', 'Stress caused her skin complains'. Prima facie, such examples refute Marty's thesis that nonreal objects have no causal efficacy. Worse is to come for the physicalist: motives, beliefs, purposes, and so on, all can be causes; even ideas can be causes. While it it true that there are ways of paraphrasing out many examples of the sort indicated, it is doubtful that all can be (indeed Armstrong, who takes causal connections to involve 'relations between universals', explicitly rejects a first-order reduction, p.425). Therewith the initial invulnerability of the thesis that no transcendent objects can act causally is shattered.

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[1] A useful and relevant discussion of acting upon may be found in Reid 1895, p.300.

[2] This may be to contract consideration to a subclass of action relations, and so to turn the dilemma into a false contrast.

Furthermore, the argument tends to backfire on Armstrong's scientific realism. For the case Armstrong mounts from physical incapacity to act on things in the world applies equally against properties. For properties are, like abstract classes, changeless, timeless, etc. They are thus not capable of physically acting upon particulars, ..., and accordingly are dispensible and ought to be dispensed with. Armstrong's assumption that properties somehow excape his argument depends on confusing properties with cases where they are instantiated (his application of thesis 1A indicates this). It can no doubt be claimed, on Armstrong's behalf, that while causal relations are (often) relations between universals, it is instantiated or particularised universals that act causally upon spatio-temporal particulars. But if the dilemma argument did work, universals would still be ruled out, unless they somehow reduce to their instances; but even an immanent theory of universals cannot somehow pull off that impossible reduction feat.

The Grand Dilemma is repeated, though with some variations, in the defence made of physicalism (77, p.417 ff.). Physicalism - equated by Armstrong with contemporary materialism, though (as Armstrong is aware) it is very different from materialism - is the thesis that

3A. The world contains nothing but the entities recognised by physics,

the[1] true physics, obviously, which is complete. The physics must be - what is remote from any scientific theory we have - complete (in an appropriate sense), else entities may fail to be recognised.

Armstrong's argument for physicalism (in 77, and also elsewhere) is the following gappy but nonetheless instructive one:- Turning the onus of proof entirely about, it is enough to consider, without further ado, the main difficulties in subscribing to the thesis.

> The main difficulties proposed for contemporary Materialism, at any rate by contemporary philosophers, are those of the apparent irreducible intentionality of mental processes, and the apparent irreducible simplicity of the secondary qualities (p.418).

However 'the contemporary materialist can argue against' these features, much as against transcendent objects with the Grand Dilemma, using the Supplementary Dilemma: Do such features as intentionality and secondary qualities bestow any causal power?

The argument thus far presupposes of course the success of the case for naturalism: otherwise nonentities also present a difficulty. And if the argument for naturalism fails as that given did, so does the case for physicalism; for physicalism is included in naturalism. Nor are nonentities the only omissions for Armstrong's select list of main difficulties. Items from the biological sciences, especially ecology, and from the social sciences, make severe difficulties for physicalist reductions, as enough contemporary philosophers have pointed out. No matter: the question of the Supplementary Dilemma can be expanded to include all such items. Moreover Armstrong's argument is not at all sensitive to the features of items so included (which is enough to engender suspicion).

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[1] By Occam's Razor, it will be the smallest: it is the intersection of all true and complete physical theories.

Horn 2. The features do not bestow causal power. The argument is said to be exactly the same as that horn considered in the Grand Dilemma; if so it is defective for the same reasons. The argument cited is simply this: if they do not bestow causal power, then with regard to the rest of the world, it is as if they did not exist.[1] Not at all. Many interrelations do not bestow causal power, e.g. intensional relations and features of explanatory relations; but they make a difference to the world, to what is true, and to how it is explained. Consider e.g. the relations and functions of economics: very few of these bestow causal power in a significant sense.

The additional arguments Armstrong marshalls against epiphenomenalism,[2] when validly formulated, beg the question against the position in their first premiss. Consider the argument (after Medlin, p.420):

> Causes of movement are always purely physical.
>
> Purposes [beliefs] are sometimes [always] causes of movement.
>
> Therefore, purposes [beliefs] are sometimes [always] purely physical.

Just what is at issue is whether causes of movement, such as beliefs, are always purely physical. And counterarguments, which are question-begging in the other direction, can easily be adduced, e.g.: Psychological phenomena are not purely physical. Purposes are psychological phenomena. Therefore, purposes are not purely physical. The issue generalises:-

(1) Purely physical phenomena are extensional [referential].

(2) Psychological phenomena are intensional, i.e. nonextensional.

(3) Intensional phenomena are not in general reducible to extensional phenomena.

Therefore

(4) Psychological phenomena are not in general reducible to purely physical phenomena.

The argument is valid. Premiss (2) is demonstrable using commonsense statements about belief or thought. Premiss (3) is demonstrable: roughly, intensional phenomena involve for their semantical assessment world transfer, but extensional phenomena do not. Premiss (1) is accepted by all leading physicalists, including for example Smart and Armstrong.[1] In fact, physicalism as usually conceived is part of a programme of referential (and so extensional) reduction. Hence, detaching, psychological phenomena resist reduction. Thus physicalism is false.

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[1] According to noneism they do not exist anyway, if they are properties. The next step of the argument to "The world goes on exactly as if such properties never truly applied", is a non-sequitur. They may, like physical properties, which are similarly situated, make a big difference.

[2] Generalised epiphenomenalism admits features which do not bestow causal power.

Horn 1. The features of items do bestow causal power. The features will, so the argument goes, be emergent features which satisfy further laws beyond those of the true and complete physics **P**: otherwise **P** will account for the features (whether they have causal power or not presumably: the premiss of horn 1 has not been used). To admit such emergent features is, says Armstrong, scientifically implausible. Is it? With *present-day* physics, it is by no means implausible, as plenty of biologists and social scientists will confirm. In the case of a physics as remote as **P** (and unless the field of **P** is illegitimately extended), do we really know that? 'The physicalist seems to be placing a good scientific bet if he bets against these emergent laws' (p.420). Again very dubious. With regard to **P**, would the bet be at all "scientific"? Yet that's all the argument. There is no dilemma, because there is nothing even remotely puzzling or unfavourable to the opposition, nonphysicalists, adduced under horn 1.

The status of the thesis 3A of physicalism is then as follows: As a statement as to the domain d(**T**) of reality **T** it is false. As regards the entity domain e(**T**) of **T**, there are two cases:-

1. Physics is taken, as by Armstrong (cf. the partist model on p.419), as extensional. Then the thesis is false, by the arguments given.
2. Physics is not confined to what is extensional (or existential) - as indeed it is not.

Then thesis 3A is, on the basis of present *limited* knowledge, very difficult to assess. It would require a considerable act of faith to believe it. More important, to believe the truth of the thesis is *unscientific*, for there is insufficient reason to believe it.

Suppose, however, 3A is reformulated with 'science' in place of 'physics'. As regards d(**T**), the thesis is still false; but concerning e(**T**), the thesis is true, indeed it is analytic, given what the (smallest) true and complete science would undoubtedly include.

More difficult is the question of the status of naturalism, or, to reorient the perspective, of the extent to which noneism supports naturalism? Naturalism, that is, in the commonplace philosophical sense, not in the sense, already considered, that Armstrong gives to it. *Naturalism*, in its philosophical sense, the OED reports, is the 'view of the world that excludes the supernatural or spiritual'. With the removal of referential assumptions, this doctrine splits into various different theses. On noneism one sort of naturalism follows, another does not, and one important issue is left slightly open. Since spiritual phenomena and things are not genuinely spatially or spatio-temporally located, they do not exist (by 'spiritual' is meant 'purely spiritual'). Hence

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[1] Premiss (1) is false, so it will be argued in the next chapter. It is falsified, for example, by materials with "psychological" properties such as memory or *telos*. However, replace 'purely physical phenomena' by 'purely physical phenomena in the sense of Armstrong' and the argument goes through with correct premisses.

N1. e($\underline{\underline{T}}$) contains no spiritual objects; i.e. no spiritual objects exist.

But spiritual objects may be perfectly good objects, thus

N2. d($\underline{\underline{T}}$) contains spiritual objects.

Naturalism ordinarily understood, which includes referential theses, rejects N2. With supernatural objects the situation is a little more complicated, and turns on how much "nature" can account for (OED again). If "nature" accounts for all objects within the space-time manifold, then the situation is like that for spiritual objects; supernatural objects do not exist, but nevertheless may have legitimate properties and occupy explanatory, but presumably not narrowly causal, roles. But if "nature" does not account for all such objects, and supernatural objects, e.g. phenomena or occurrences have, as they are alleged to have, rough spatial locations, then such objects exist. The question is then an empirical one to determine whether such putative supernatural objects do indeed have a spatial location. If they do, the confirmed naturalist is bound to try to say: they are "natural" objects which naturalist scientific theory has not yet accounted for, but it will - the great act of faith on the "scientific" side of the naturalism debate becomes conspicuous.

The spatio-temporal criterion for existence, which yields thesis N1 does not imply that the commonplace thesis of materialism, that 'nothing exists but matter' (OED), is correct. For that materialist thesis to hold a range of objects, which are not spiritual objects, with satisfactory spatial credentials but no matter (or mass) have to be somehow discounted, e.g. holes, shapes, gaps, wormholes, photons. By contrast, materialism in the tradition of philosophers like Hobbes, implies not just the commonplace thesis, but referential reduction, and accordingly is to be rejected.

The noneist rejection of extensional and existential reduction can provide the basis for a rational alternative to the mechanistic view of the world, that is the view that the world and the systems and organisms in it should be understood on a mechanistic model, as, like a machine, lacking purposes, goals and intentions generally. The logical core of mechanism is extensional reductionism; and the philosophical thrust of mechanism is - like behaviourism, physicalism, and similar - always to reduce or deny the intensional, in both the nonhuman and often the human situation.[1] Although mechanism, that is mechanistic reductionism, is only a variety of extensional reductionism (mechanism implies extensional reduction but not conversely), the rejection of extensional reductionism and the resulting recognition of the irreducible character of the intensional entails the rejection of the mechanistic account of the world. This opens the way for due acknowledgement of intensionality and intentionality, of goals and purposes, featuring in a widespread way in the world, not just in the human sphere, and thus to a thoroughgoing rejection of mechanistic hypotheses.

Intentionality is a subvariety of intensionality. Some intensional matters are concerned with intentions, with things intended or purposes (cf. OED), but many are not. Purposes and goal-directness are, like intentions, intensional matters because their semantical assessment involves alternative situations, e.g. those where the objective is realised. All the characteristic marks of intensionality are present, e.g. failure of replacement of extensional equivalents in intentional-type functors (e.g. 'To show that p was the goal'), inexistentiality. As before (in 1.24), it is necessary to distinguish different levels of intentionality. Intentional functors reflect a high level of intensionality. The result is important for the question of the reduction of ecology to the more mechanistic science of physics.[1] The reduction question is going to be answered in the nagative, since worlds required for the semantics of goal-directness are not included in those called for in the semantics of physical theory.

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[1] A common qualification of this view sees the world as mechanistic except for humans - humans (and only humans apart from gods) are allowed to have intentions. This faulty dualism, which provides a major refuge for human chauvinism, receives strong support also from extensional reductionism, through a linguistic analysis of intensionality and the attribution of language to humans alone.

Does denying that the world can be understood as a machine in extensional reductionist terms commit one to some form of pantheism or to mentalism, to the view of the world as containing purposes or goals which are the expression of a universal mind, an expression of the mental or of Spirit? For example, to a Hegelian or other idealistic position? Although there are (naturally) correct insights in these mentalisms, the familiar contrast between mechanism and mentalism, or between mechanism and pantheism, is a false dichotomy, and is based on a fallacy.[2] The denial of extensional reductionism does not commit one to mentalism or to any form of phychologism. The fallacy involved, the familiar contrast of the mind with the machine, is that of equating the intensional with the mental (for an illustration of this mistaken equation in operation, see p.812). The fallacy underlies both the claim that the rejection of extensional reductionism is some form of mentalism, and the conventional argument for pantheism (and indeed for some forms of theism) which starts from the discernment of goals, purposes and meaning in nature and thus the rejection of mechanism. But examples of intensional functors which are not mental in any good sense are rather obvious; e.g. necessity, possibility, causation, implication, probability all spring to view, and demonstrate that the intensional cannot be equated with the mental.

Of more importance for questions concerning living organisms and systems, is that the concept of goal-directness, of purposiveness, of design, is irreducibly intensional; it cannot be explicated in extensional or referential terms, for reasons which should now be familiar. Nevertheless it is not 'mental' in the sense of presupposing that the item having goals or exhibiting purpose has a mind or intelligence in any full or good sense. For instance, an eco-system may be goal-directed, with such goals as the maintenance of a certain equilibrium, but we are not therefore obliged to say that it has a mind, e.g. thinks, has beliefs, etc. This is bad news for the argument from design which thus rests, among other things, upon the fallacy of equating the goal-exhibiting with the mind-exhibiting. The point is relevant also to the Gaia hypothesis, where facts taken to suggest that the planet exhibits goal-directed or optimising behaviour are taken in some quarters to show the correctness of a form of pantheism, that the planet would in that event possess a mind, and the two theses are equated. Thus one can see the universe - perhaps devoid of humans - in nonmechanistic terms as containing, among other things, nonhuman, living systems and organisms, which possess goals and purposes of an (irreducibly) intensional character, without presupposing that such items have minds or that the system as a whole possesses a mind. This has an important bearing on the question of whether items other than those with minds can be the objects of moral consideration and respect, for the reason that the possession of intensional characteristics such as goals and purposes are significant criteria for the bestowing of moral consideration.

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[1] Almost by definition, machines of mechanistic physics do not exhibit intentional behaviour, they lack goals and purposes and do not exhibit intelligence. Insofar as machines (e.g. modern computing machines) may be said to have such features, the features are not strictly the machines' own, but programmed into them by designers or operators; they are externally-imposed, not internal. At the point where "machines" have their own internal goals and purposes, they cease to be machines.

[2] So to dualisms are based on an error.

CHAPTER 10

THE IMPORTANCE OF NONEXISTENT OBJECTS AND OF INTENSIONALITY IN MATHEMATICS AND THE THEORETICAL SCIENCES

The more comprehensive case for the importance of nonentities includes, as especially significant, their role in mathematics and their roles in the theoretical explanations of science - the whole business, that is, of appealing to ideal simplified objects, which suitably approximate real objects, in problem solving and theoretical explanation. More generally, the theoretical sciences are seriously nonreferential, both in having as their primary subject matter nonentities, and in being ineradicably intensional. This thesis runs entirely counter to empiricist philosophies of science, which have long dominated the subject (to its detriment), according to which the language of science is, or ought to be, referential. Empiricist thinkers have, until very recently,[1] regarded the citadel of science as exclusively theirs: and the main goals of philosophy, as they conceive them, have been determined by the defence and extensions of the citadel to increase its power over the intellectual landscape. Thus they have taken the language of science, properly refined referentially of course, as the ideal of language, to which much ordinary language is at best a shabby first approximation; and they have characteristically seen philosophy as the handmaiden of science, as like a servant clearing away rubbish in the way of scientific progress or questioning scientific practice and values, or as a subsidiary scientific activity of conceptual analysis and reconstruction aiding the defence or advance of total science. A basic assumption in all this, without which much of the superstructure collapses, is that both the language of science and scientific theories conform to empiricist canons: the assumption is false - so at least it is now argued. The case begins by considering mathematics, which forms an integral part of much theoretical science.

§1. *Is mathematics extensional?* The received answer is, Yes. The correct answer is, however, No: certainly not, Yes. But a satisfactory answer does not say, No, without some further elaboration; and really a somewhat more complicated story needs to be told.

It is a commonplace of modern texts on logic and the foundations of mathematics that mathematics is extensional. The following texts reveal the encroachment of the thesis:- According to Whitehead and Russell (PM, p.74):

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[1] With the advent of Marxist and other alternative philosophies of science, e.g. Feyerabendian nihilism. The main theses defended in this chapter and the next one are, however, as damaging to materialism and nihilism as they are to empiricism.

> ... the functions of functions with which mathematics is specially concerned are extensional, and ... intensional functions of functions only occur where non-mathematical ideas are introduced, such as what somebody believes or affirms, or the emotions aroused by some fact. Hence it is natural, in a mathematical logic, to lay special stress on extensional functions of functions.

The same authors say in Appendix C of PM:

> mathematics is essentially extensional rather than intensional.

Similarly Kneebone (63, 117):

> Mathematics, as it exists today, is extensional rather than intensional. By this we mean that, when a propositional function enters into a mathematical theory, it is usually the extension of the function (i.e. the totality of entities or sets of entities that satisfy it) rather than its intension (i.e. its 'content' or meaning) that really matters (63, p.117).

The thesis appears in a different, and now too widely accepted, form in Quine (FLP, p.30):

> Such a language can be adequate to classical mathematics and indeed to scientific discourse generally, except insofar as the latter involves debatable devices such as contrary-to-fact conditionals or modal adverbs like 'necessarily'. Now a language of this type is extensional, in this sense: any two predicates which agree extensionally (i.e. are true of the same objects) are interchangeable salva veritate.

This selection of texts is enough to indicate that the claim that mathematics is extensional is widespread. But neither the claim 'mathematics is extensional' nor its first modification 'mathematics is essentially extensional' are altogether distinguished by their clarity or entirely self-evident. So it is a bit surprising that the claim is repeatedly made, as if it were now some sort of truism, and not in need of any further detailed substantiation.

Consider first the claim:

(A) Mathematics is (essentially) extensional.

Questions which arise at once are these:-

(1) What is meant here by 'is extensional'?

Isn't extensionality a property of properties and attributes? How can a discipline or subject significantly be extensional? This suggests what Carnap makes explicit (e.g. in MN) that (A) is a contraction of something like

(A_1) All the functions of functions of mathematics are (ultimately) extensional.

(2) What exactly is intended in (A) by 'mathematics'?

Mathematics as actually practised - at all times, at present? Or what it might include? And mathematics as it is, or as it *could* be expressed (as it could be extensionalised)?

(3) What sort of the claim is the claim (A)? Is it analytic? Or is it empirical - then what evidence would count? Or normative - are logicians telling mathematicians what they should be doing?

It may look as if the sources quoted agree as to the extensionality of mathematics while differing as to what is meant by *extensional*. Quite the reverse is the case: they agree at base as to what extensionality is, and differ as to the claim regarding mathematics. 'Extensional' is used, in each case, in that central sense selected from traditional senses by Whitehead and Russell (for a sample list of other modern senses of 'extensional', which strengthen material equivalences to strict equivalence or relevant coimplication, or to identity of some sort, see in particular Barcan-Marcus 60). According to Whitehead and Russell, propositional functions (of one or more places including connectives and quantifiers) of propositional functions (of zero or more places) are extensional, where materially equivalent functions (of the latter class) can be interchanged preserving truth-value, i.e. maintaining material equivalence. Specifically, for one-place functors of propositions (zero-place functions):

$$\mathrm{ext}(f) =_{Df} (p,q).\ p \equiv q \supset.\ f(p) \equiv f(q).$$

For n-place functions of propositions (again in essentially the notation of PM):

$$\mathrm{ext}_i(f^n) =_{Df} (p,q).\ p \equiv q \supset.\ f^n(u_1, \ldots, \underset{\text{place } i}{p}, \ldots, u_n) \equiv_{u_1, \ldots, u_n} f^n(u_1, \ldots, \underset{i}{q}, \ldots, u_n); \qquad \text{and}$$

$$\mathrm{ext}(f^n) =_{Df} \mathrm{ext}_1(f^n)\ \&\ \mathrm{ext}_2(f^n)\ \ldots\ \&\ \mathrm{ext}_n(f^n),$$

i.e. f^n is completely extensional iff it is extensional in each of its n places. The remaining and general cases are direct generalisations of these, namely, in the one-place case,

$$\mathrm{ext}(f) =_{Df} (\phi, \psi)(\phi\underset{\sim}{x} \equiv_{\underset{\sim}{x}} \psi\underset{\sim}{x} \supset.\ f(\phi) \equiv f(\psi)), \text{ and in the n place case,}$$

$$\mathrm{ext}_i(f^n) =_{Df} \phi\underset{\sim}{x} \equiv_{\underset{\sim}{x}} \psi\underset{\sim}{x} \supset_{\phi,\psi} f^n(\ldots \underset{\text{place } i}{\phi} \ldots) \equiv f^n(\ldots \underset{i}{\psi} \ldots),$$

where in each case vector $\underset{\sim}{x}$ abbreviates the ordered n-tuple $(x_1, \ldots, x_n)$.[1]

Quine, with his very conservative - not to say reactionary - views as to what makes sense, cannot avail himself of these definitions, involving as they do quantification over propositions, attributes, or the like. He has to resort to a roundabout metalinguistic account - a predicate place is extensional if any predicate which agrees in extension can replace it *salve* veritate - but it comes to the same,[1] evidently enough, when the linkage to language is made. A language, or theory or discipline, is extensional if all functions of functions which occur in it are completely extensional. And that happens if and only if all predicates meet Quine's condition, i.e. if they agree in extension they are interchangeable salva veritate.[2] For example, the usual languages of class theory are extensional by virtue of an explicit axiom of extensionality:

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[1] It is important that the quantifiers used in the standard definitions are the usual existentially-loaded ones.

$$x \in v \equiv_x x \in w \supset. A(v) \equiv A(w) \quad ,$$

for every scheme A(v) not binding v (or w). Given the familiar definition of class identity (coincidence) in terms of sameness of reference, $u = w =_{Df} (x)(x \in v \equiv x \in w)$, the extensionality axiom becomes a version of Leibniz's Lie:

$$u = w \supset. A(v) \equiv A(w).$$

To say mathematics is extensional, then, is to say that all propositional functions of propositional functions occurring in its language or theory (and so all its connectives and quantifiers) are extensional. And this is to imply not only that mathematics has a language or is a theory - something intuitionists, and others who think that mathematics is not language-bound, might be less than happy about - but that however extended the language of mathematics remains extensional. Surely this is extremely unlikely: the methods of mathematics cannot be applied to intensional discourse and the application counted as mathematics? The prescriptive, legislative, character of any claim that mathematics is extensional begins to emerge. But in fact none of sources quoted do claim that mathematics is extensional.

The claims made concerning the extensionality of mathematics by the authors quoted are moreover each of them different. Thus Whitehead and Russell claim, first of all, that mathematics is specially concerned with extensional matters - as if the Queen of disciplines may also be concerned with intensional matters, as She may - and secondly, what is different, that mathematics is essentially extensional, which they take as saying

> we can decide that mathematics is to confine itself
> to functions of functions [which are extensional] (p.401).

Thus it becomes a matter of definition that mathematics is extensional:

> this assumption of extensionality can be validated by
> definition (p.401) -

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[1] Of course a Quinean can't agree either that it comes to the same, since one side of the equivalence (that drawn from PM) makes no sense on his precepts.

The (alleged) failure to make sense of such commonplace logical notions, as e.g. intensionality defined in the fashion of PM, is a peculiarity of Quineans; it has nothing to do with the rejection of noneism. Russellians, Carnapians, and so on, can make perfectly good sense of the notions.

[2] Kneebone's formulation fits in here; for if only the extension of a function matters (truth functionally) it can be replaced by any other function with the same extension, i.e. agreeing in extension.

an amazing piece of Humpty-Dumptyism. Mathematics, whatever it is, is not something Whitehead and Russell could simple redefine in their second edition so as to guarantee the extensionality thesis. Kneebone, on the other hand, tells us that present mathematics is extensional rather than intensional, as if it is a contingent feature, not an essential one. Kneebone's claim may seem a curious one, but it is nearer the mark than the Whitehead and Russell claim: there has been a fairly concerted effort in modern times to push mathematics into an extensional mould. Kneebone's elaboration of his claim is however curious, for by extensional we do not mean that it is usually the extension rather than the intension that really matters. Extensionality requires that it is always just the extension that matters. When repaired Kneebone's elaboration yields a claim inconsistent with his first claim; the claim that present mathematics - or better perhaps, present mathematical practice - is usually extensional (in character). And this claim is, it will emerge, nearer the truth than his first claim.

And interestingly, Quine does not claim, any more than Whitehead and Russell or Kneebone, that mathematics - or even classical mathematics - is extensional: all he says is that an extensional language can be adequate to classical mathematics and, later in FLP, that 'no other mode of statement composition is needed, at any rate, in mathematics' (p.159, my italics). Evidently some sort of reduction, and purification, programme is already presupposed - a programme the crude shape of which we already know (from WO). The canonical grammar of the canonical language, which includes as much of mathematical language as is worth bothering about, is whittled 'down to predication, quantification, and truth functions'. Then 'one law that is easily proved by ... induction is that of extensionality' (WO, p.231), i.e. extensionality whether or not an initial condition of adequacy, is a criterion of what is presented as a clear and rational - and almost inevitable - choice of canonical language.[1] If some of mathematics were to be left out, it would be so much the worse for it: it would be bound to have some serious deficiency, being either unclear or ill-behaved or unneeded and, most likely, all of these. Of course Quine thinks none is left out:

> all logic and mathematics is expressible in this primitive language (FLP, p.89)[2]

he informs us, in one of the whopper falsehoods of modern philosophy. The argument from history is conclusive against the first of these claims: as many of us know, there have been more than two thousand years of logic, and much of what has been investigated, from forms of the syllogism (e.g. the modal syllogism) and elementary nonclassical propositional logics on, are not expressible in Quine's very primitive language. The proof of the latter is simply that these logics involve intensional functors which are demonstrably not expressible in Quinese.

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[1] In this way too, by having extensionality as a derivative feature, Quine avoids the problem that faced Polish logicians in the tradition of Lesniewski, of explaining why extensionality is such a virtue - especially since nonextensional discourse was not at all obviously unintelligible or lacking in clarity.

[2] The primitive language of FLP is equivalent to the canonical language of WO.

An extensional language is not adequate to express all logic. The larger history of mathematics, the history that includes more than the success stories from a modern extensional standpoint, likewise appears to show that an extensional language is not adequate to express all the mathematics of the past (not to mention that of the future yet). What is the evidence then that an extensional language is adequate? Quine puts the conventional case nicely (FLP, p.89):

> A fair standard [of adequacy of a systematisation] is afforded by Principia; for the basis of Principia is presumably adequate to the derivation of all codified mathematical theory, except for a fringe requiring the axiom of infinity and the axiom of choice as additional assumptions.

It all goes back to Principia, PM. But do we really know that Principia, or its basis, is adequate for the derivation of all codified mathematical theory? An honest answer has to be that we do not. The originally planned work in rational mechanics was abandoned; the volume on geometry was never written; and much previously codified mathematical theory was not included, e.g. not only controversial theories such as those of infinitesimals and larger transfinite numbers, but uncontroversial theories such as those of matrices and tensors. With some solid hand waving some of this material can, presumably, be got by; and some cannot. Even with the codified material which can, it is claimed, be expressed, serious questions of adequacy remain. Is Principia adequate for the expression of number theory even, when on its account numbers are ambiguous as to type, and each number fragments into infinitely many different objects of distinct types? Enough people have doubted it, to make the adequacy of the whole thing questionable. Ah! but there are adequate reductions these days, in Zermelo-Fraenkel set theory and it elaborations, we are told. Is an account which makes 6 a member of 7, each number a member of all its successors, zero a subset of all sets whatsoever and element of every number, adequate? It is far from clear that an analysis which brings out some of the expected features of number theory (e.g. the Peano postulates, but again, doubtfully, the role of numbers in commercial activity such as shopping) by assigning numbers a great many properties they do not, or do not significantly have, should be accounted adequate.[1] Only with dubiously low standards of adequacy are the rough-as-guts methods of Zermelo-Fraenkel set theory adequate to express arithmetic.

In order to establish claim (A), or variants thereon such as

(A') An extensional language can be adequate to express classical mathematics,

it is necessary to circumscribe mathematics, or classical mathematics (e.g. the latter conventionally as all codified mathematics up to some rather arbitrarily selected date or period). But in order to refute claim (A), or variants, it is not necessary to circumscribe mathematics. There is, in other words, the usual asymmetry between verification and falsification of a universal claim. It is however very much to the point to raise issues that bear on the question (question 2 above) of the extent of mathematics; in particular, the question as how the practice of mathematics connects with the discipline. (The question becomes even more important when the issues are generalised to science: e.g. what happens to mistaken practice and to all the false theories?) It is of course not difficult to say in a rough and ready way how mathematics links with practice: mathematics is what mathematicians do when engaged in their characteristic professional (or amateur) activity.[1] The actual practice is full of mistaken starts, uncompleted proofs, fallacious arguments, and many other things. In circumscribing mathematics much of this practice, and the discourse that issues from it, is put aside: it is not part of the finished product, not really mathematics it is said (though it is what gives the discipline its life). With mathematics the problem as to the place of false theories does not arise in the sharp way it does with science, since any consistent theory can be absorbed - at worst conventionally, as true according to its own lights[2] - but a problem as to the place of inconsistent theories does arise, a problem that has not been seriously faced by most philosophies of mathematics. It is clear enough however that inconsistent theories can take their important place in Wittgenstein's city of mathematics (remember how in 56 the idea of mathematics as family is conveyed by the appealing city and suburbs model).

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[1] With an alternative intensional analysis these sorts of difficulties can be avoided; see Routley 65.

A conspicuous feature of the practice of mathematics (to part of which Lakatos 63 has drawn attention) is the statement of open questions, the setting of problems (some of them unsolved, some of them exercises) the making of conjectures, as well as the success stories: the verifications, proofs, solutions, and refutations. It is with the records of successful mathematical enterprises that the foundations have been primarily or exclusively concerned. But the rest of the practice is mathematically important, and some of it is codified in the histories and textbooks. So result direct - if controversial - counterexamples to the extensionality thesis. For example, when a mathematics text asserts that it is believed that Goldbach's conjecture is true, that is an assertion of mathematics, isn't it? The following statement is surely in order in a mathematics textbook: Goldbach conjectured that every even number is the sum of two primes? Yet such functors as 'a conjectured that', 'b refuted the claim that', 'c verified that' are none of them extensional. The codified record of mathematical practice is littered with intensional functions. Some of the functors commonly used are in fact very highly intensional; e.g. 'It is trivial that', 'It is mathematically important that', 'It is difficult to show that'. In the extensional purification of mathematics of all this notation is seen as extraneous and is removed as inessential, by a wipeout or deletion procedure much resembling censorship. It is true that proofs, which are stuff of mathematics, and logic, do not usually depend on the intensional functors that are wiped out: so it is not quite as if the claim (A) is beginning to vanish, as it may have begun to seem, into the trivial claim that the extensional part of mathematics is extensional.

There remain, however, other classes of intensional functors, very commonly used by mathematicians, which do not succumb so readily to extensional censorship. A first class of these includes such systemic notions as consistency (is the calculus consistent?) and independence (e.g. is the parallels postulate independent?). A second closely allied class includes such intensional functors as those of possibility, necessity and implication and, to move to a suburb, of probability.[1] Such functors are widely used; so, as against Kneebone, intensional functions occur in mathematics as it is practiced today.

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[1] This is simply a variation on a famous circular reply to the question: What is philosophy?

[2] As is shown in MTD and repeated in 1.24 above.

Mathematics as historically practised, before the introduction of modern modal theories, was modal in a thoroughgoing unformalised way. It was not only full of modal terms, such as 'must' and 'can' and 'impossible'; it was also essentially concerned with provability. Consider however, the functor 'It is (mathematically) provable that'. It is not extensional, since any correct theorem of mathematics is truth-functionally equivalent to any contingent truth, but claims as to the provability of the mathematical theorems are not equivalent to claims as to probability of the contingent truth. In short, the form of the argument is: ϕ (e.g. provability) is not extensional, ϕ (provability) is a mathematical functor, so mathematics is not extensional. It is the same with other functors, such as implication.

The extensionalist ways with these objections are various, but they have some important common elements. One of these common elements is the dissection of mathematical discourse into a hierarchy of languages, along the lines of a levels-of-language theory. And of course with the levels-theory some of the uses of modal functors in mathematics can be accounted for extensionally. Such functors as those of necessity, consistency, provability, and so on, can be reconstructed as metamathematical functors - to some extent: for unlike the functors they are supposed to reconstruct iteration of the functors is not defined nor is quantification which binds variables inside the functors. That is, the metalinguistic reconstruction is not adequate to the task.[2] Yet - and this is not so often noticed - the metalinguistic reconstruction is not simply an option, but something like it (e.g. analogous sorts of hierarchies, such as the orders theory of PM) seems to be compulsory. Tarski's arguments from an analysis of semantical paradoxes are commonly taken to show this (and barring an assumption or so they do). But quite elementary counterexamples to thesis (A) will serve to make the point. The extensionality of a language implies the referential transparency of all its predicates. But elementary mathematical language contains predicates which are not transparent, as the following example (due to K. Slinn, a high school mathematics teacher) shows:

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[1] Several notions from statistics and probability theory appear to be non-extensional, e.g. such notions as randomness.

[2] Other objections have already been marshalled to the common proposal that such functors as provability be analysed quotationally, whether directly (with, e.g. 'It is provable that 2 + 2 = 4' rendered ''2 + 2 = 4' is provable') or in a more circuitous fashion (e.g. Davidson's analysis, which gives the ill-formed 'It is provable that. 2 + 2 = 4', or Burdick's analysis which almost defies English rendition): see 8.1 and 1.7. An important objection which appears to refute such quotational-type analyses on their own grounds (i.e. using only classical assumptions that are accepted), is R. Thomason's adaptation of Montague's argument: see Thomason 77.

> The denominator of 2/4 is 4. But 2/4 = 1/2. So by transparency, the denominator of 1/2 is 4.

Accordingly 'the denominator of ... is ---', which is clearly a mathematical predicate, is not extensional. Similar nonextensional results are yielded in almost any of the many cases where in mathematics one forms equivalence classes and identifies elements thereof though not all properties are preserved under the filtration (i.e. under the restricted homomorphic mapping). Cases where mathematics employs devices which are implicitly quotational - which is the way extensionalists try to write off counterexamples such as the denominator case - are only a special case of a much more general phenomenon in mathematics of filtration-induced opacity and intensionality. For this reason the strategy of dealing with opaque counterexamples by exiling what are said to be implicitly quotational predicates (alleged to involve use-mention confusions) to the metalanguage - where limited quotational devices can enter - is inadequate.[1] Even if it were true that opaque counterexamples could be removed by thoroughgoing use-mention debugging and summary arrest of all implicitly quotational predicates, there is something radically unsatisfactory with the contention that even elementary mathematics is stuffed full of use-mention confusions, and to be salvaged should strictly be restructured in accord with a levels-of-language theory. It is not just that there are many many objections to the levels theory, and to the proposal to restructure language hierarchically: it is, once again, that mathematics is not at all like this, that mathematical discourse is not so structured and, moreover, strongly resists such restructuring. Mathematics as practised is pretty much in order as it is. It is not full of use-mention confusions: all that is is mathematics as seen in the light of extreme extensionality assumptions. The extensionalist way becomes thoroughly prescriptive: it becomes a recommendation as to how mathematics ought to be extensionally restructured. But it is a prescription that can hardly succeed given emergence of quite explicitly intensional mathematics, such as intuitionistic mathematics, positive mathematics, modal mathematics, and in these enlightened days, relevant mathematics.

Pre-twentieth century mathematics, which is often what is referred to as 'classical mathematics', although much of it was codified, lacked an explicitly formulated deductive structure. The modern assumption has been that the structure when formulated will be that of extensional logic. That assumption is, even a little historical investigation leads one to suspect, entirely mistaken. Insofar as a minimal presupposed structure can be uniquely determined, it was and remains (at least where logically uncorrupted), so it seems, a logic of at least modal strength: for example, an assumption of an S4 implicational structure gives a better account of the data to be accounted for than an extensional assumption. It is immaterial, for the present argument, what specific form the intensional deductive structure of classical mathematics takes: it is enough that it is not extensional. Settling even the intensional-extensional issue will not, however, be an easy historical (or purely historical) exercise.

The twentieth century has seen, and is seeing, the development of mathematical theories with explicitly intensional logical structure.

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[1] Compare again the misguided attempts to make out that such intensional operations as those of believing, conceiving and seeking are really quotational.

Intuitionist mathematics is already a well-developed mathematical theory (it was well enough developed when Quine made his claims). There is moreover no reason why theories based on other nonextensional logics should not become a well-developed part of mathematics - they are already, in a good sense, part of it. The upshot is that mathematics is not essentially extensional: if it ever was extensional, that was a merely contingent matter.

It hardly suffices to claim that intensional functors which iterate such as implication, necessity, and so on, cannot belong to mathematics (a line Quine's philosophy may suggest). For mathematics is at least, on all accounts, the abstract science of number and space; and it includes different theories of number and space, e.g. non-Archimedean arithmetic, intuitionistic arithmetic, hyperbolic geometry, some of which may well be - there is no excluding it - intensional.

There is one line of reply left to the extensionalist, appeal to the thesis of extensionality, namely to the thesis much canvassed by Carnap, that for any nonextensional system there is an extensional system into which it can be translated. It is important to observe that such an appeal to the thesis of extensionality (or a mathematically relativized version thereof) amounts to abandoning (A) and its variants, to giving up the claim that mathematics is somehow already extensional, for a very different claim, namely

(B) Any systematisation of mathematics can be translated into an extensional system,

or, put differently, mathematics can be re-expressed in purely extensional terms.[1]

None of the earlier objections against (A) and its variants apply against (B). Indeed (B) is true, since the thesis of extensionality has been established (so at least it is claimed in US and ER).[2] But (B) does nothing to show either that mathematics is extensional, or that an extensional reformulation is preferable. Moreover the translation does not so much eliminate intensionality but suppresses it into unanalysed elements - worlds or the like and their interrelations - at the base of the extensional reformulation. Carnap is well aware that proof of the thesis of extensionality would hardly be a panacea for [apparent] difficulties of intensionality such as the antinomy of the name relation; in an important statement he remarks:-

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[1] Stronger versions of thesis (A) typically reduce to thesis (B). For instance, Smart's claim that 'in a sense, there aren't any intensional contexts' becomes when counterexamples are mentioned, the claim that 'when they are properly analysed they turn out to be extensional after all'. There is a reluctance however, especially among those impressed by Davidson's referential research programme, to step down from (A) to (B). For the Davidson thesis (sometimes at least) seems to be that apparently intensional frames when properly viewed (e.g. by restoring a deleted full stop or so) are really extensional.

[2] With translation conforming at least to strict requirements, and probably to more rigorous requirements.

> We should have to show, in addition, that an extensional language for the whole of logic and science is not only possible but also technically more efficient than nonextensional forms. Though extensional sentences follow simpler rules of deduction than nonextensional ones, a nonextensional language often supplies simpler forms of expression; consequently, even the deductive manipulation of a nonextensional sentence is simpler than that of the complicated extensional sentence into which it would be translated (MN, p.142).

While the pragmatist overemphasis on technology, on simplicity and technical efficiency, at the expense of other factors which are more important in choice of system leaves something to be desired, the central point that intensional systems may be superior to their extensional translation - and some of the reasons therefore - comes through clearly. What does not, however, emerge is the quite fundamental point that extensionalese is a dependent mode of discourse, that because intensionality is suppressed into the primitives of the extensional translation, the primitives themselves can only be explained satisfactorily by return to intensional discourse. Applications help to reveal this, in particular the serious problems of explaining and determining the primitives of extensional translations of intensional scientific theories (an expanded discussion of these points is given below).

§2. *Pure mathematics is an existence-free science.* The thesis, already introduced and defended in a preliminary way (cf. p.29), has several strands, namely

1) The objects investigated in pure mathematics do not exist,

2) The statements of pure mathematics do not entail existence claims, in particular (in virtue of 1) claims as to the existence of mathematical objects (cf. Reid 1895, p.442). A specific existence claim is a claim of the form '... exist(s)' or of the form 'There exist(s) ...'.

Strand 1) may be proved by the following syllogistic argument:

a. The objects of pure mathematics are abstractions, never particulars.

b. Abstractions do not exist, only particulars do.

Ergo, the objects of pure mathematics do not exist.

As always the proof is only as good as the premisses. Premiss b has already been argued for in previous chapters. Premiss a is a by-product of modern derivations of mathematics from foundational systems. Consider, for example, the reconstruction of most of modern mathematics within the framework of Zermelo-Fraenkel set-theory without individuals (the treatment mathematics gets is very rough and crude, but the reconstruction will serve to make the point sought). The objects the construction provides are entirely abstract, always sets in fact, and commonly complex set-theoretic constructions from the null set. Furthermore, all of mathematics that lies outside such set-theoretical recapture is likewise abstract, e.g. parts of category theory, where the objects are always functions. Thus a holds as well as b whence the conclusion follows.

Strand 2) may be argued for using strand 1).

c. The statements of pure mathematics are about, or generalise or particularise concerning, the objects of pure mathematics. (This premiss is easily extended to more complex languages, e.g. to free λ-categorial languages.)

d. None of the objects concerned exist (by 1)).

Hence

e. None of the statements of mathematics involve specific existence claims; and so neither do they entail such, since entailment is an inclusion-of-content relation (see UL). A detailed defence of premiss c calls for a theory of aboutness (such a theory for quantificational languages may be found in Slog, chapter 3); and derivation of the last part of e requires, of course, a good theory of entailment. But both can be supplied.

It will quickly be objected that it is here the noneist who is ignoring mathematical practice. For existence theorems are common among mathematical results. On the surface that is so. The noneist response looks like one that ought to be coming from the opposition; it is that either mathematics with existence theorems has been misleadingly formulated under the influence of a mistaken philosophical theory, platonism, or else such results are mistaken. Everyday mathematics with existence theorems, is, unlike much ordinary language, not in order as it is. Consider, first, some of the acclaimed existence theorems. There are interesting theorems in higher dimensional geometry which are stated in such forms as

i) There exists an n dimensional space with these properties: .... But where n is large, e.g. substantially greater than 4, who really believes there *exists* such a space? None but platonists. Yet the result and its proof will (typically) be acceptable if neutrally reformulated, e.g. as

ii) Some n dimensional space has these properties ..., i.e. as a *particularity* theorem (*not* as a consistency theorem). Existence disappears, and acceptability increases, upon reformulation. Consider, secondly, how "existence theorems" are proved. Following intuitionistic and other investigations, methods can be divided into two sorts: direct and indirect. Direct proof proceeds by presenting an object with the correct properties (say a which has complex property f), and then existentially generalising. But by strand 1), the object a presented does not exist; hence use of EG is illegitimate. All that af validates is $(Px)xf$, *not* an existence claim $(\exists x)xf$. Indirect proofs, which are intuitionistically inadmissible, characteristically proceed by deducing a contradiction from the negation of the assumption to be proved. Such proofs break down unless reformulated neutrally. For let the assumption be $\sim(\exists x)xf$, i.e. $(\forall x) \sim xf$, that is (with classical restricted variables) $(x)(xE \supset \sim xf)$. To instantiate and use a premiss of the form $\sim bf$ (for some object b), b would however have to exist, again contradicting 1). In short, insofar as mathematics does contain existence theorems, it exceeds its data; it imports platonistic assumptions to the effect that its objects exist, or even that they have to exist.[1]

It is indeed sometimes claimed that mathematical items have to exist in order to have the correct properties, and so that deductions and calculations can be made concerning them and their features. Given neutrally-formulated axioms, and in particular properly qualified Characterisation Postulates, such claims lose their cogency. From them all the properties needed to cope with nonentities in deductions and calculations can be neutrally derived. In this way defective ontological assumptions can be avoided, the best of all worlds can be obtained - tractable mathematical nonentities with appropriate features, without having to assume, as standard positions require, that they exist.

§3. *Science is not extensional either.* The intensionality of science follows from that of mathematics and logic given a few popular assumptions, for example thus:-

f. 'Logic, like any science, has as its business the pursuit of truth' (Quine 59, p.xi)[2]; so logic is a science.

g. Intensional logic is part of logic

h. Intensional logic is part of science.

Ergo, science is intensional, because it is intensional in part. Such arguments are easily broken by appeal to the traditional distinction of sciences into pure and empirical. Even if the pure sciences, such as logic, have substantial intensional parts, the empirical sciences are not so contaminated.

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[1] Nothing of course prevents the following out of consequences of assumptions that such and such exist. But only assumption-relative existence theorems result in this way. And if the assumptions are to the effect that abstract objects such as sets exist, then they are false, and the assumption-relativity cannot be removed.

[2] The unnecessary part of the premiss, the view of science as the pursuit of truth, is of concern subsequently. The view, found in many logical empiricists, does not withstand even superficial examination. Parts of the fine arts and of mysticism and of philosophy are engaged with the pursuit of truth. Thus e.g. Pap (62, p.4): 'if we define philosophy as an indefatigable, unprejudiced search for the truth, we fail to differentiate it from science'. And all too much science is not the unbiassed pursuit of truth it is so often sold as being.

Furthermore, if science were the pursuit of truth, an extensional science would certainly be inadequate for there are many intensional truths to be accommodated in theory and to be explained (e.g. those of history, sociology, and psychology, as well as those of the physical and biological sciences).

With the refined question 'Is empirical science extensional?'[1] it is still basically the same show as the mathematics show over again, only there are some scenes that were cut from the mathematics show because they are of less importance there (they could have been introduced by way of questions about applied mathematics and one of its branches, purely theoretical physics). Some of the new scenes concern of course that familiar cluster: conditionals, counterfactuals, causes, dispositionals and laws. For variety let us run the show in reverse.

In virtue of the theorem of extensionality any formalisation of a scientific theory, or of science as a whole, can be extensionally rerendered. There are some difficult preliminary questions (which Brouwer 75 also raised for mathematics) as to how much of science, as a practice and activity, admits of formalisation. After the heady days of logical empiricism when it was only a matter of time before all extant science was formalised - in fact remarkably little was ever formalised[2] - something of a reaction has set in. It is even suggested that modern physics lies beyond language, and cannot be precisely formulated (Capra 75, chapter 3). Some of the interesting arguments for this claim do not withstand close scrutiny[3]; but others are, classically at least, irresistible. The reason is that the limitative theorems are classically correct. Let Θ be a scientific theory which contains all of number theory, or, to simplify the case a little, Kleene's T-predicate $(y)\ \bar{T}_1(x,x,y)$. A correct and complete classical formal system for Θ would ipso facto include a complete and correct formal system for $(y)\ \bar{T}_1(x,x,y)$; but by Kleene's generalised form of Gödel's theorem (52, p.302) there is no such system. Hence there is no correct and complete classical formalisation of Θ.[4] This has several well-known

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[1] There is no full answer to the question To what extent is empirical science referential, or extensional?, without some conditions on what science comprises, how much of the practice of science science is supposed to include, and what sort of statements can get into the theories of science. Is science (as the dictionaries would like to think) a body of knowledge, or is it a collection of theories of certain sorts, and to what extent does it include practice? And applications? These questions as to the scope of science will become increasingly important, and to the point, as further questions as to the character of science are asked, e.g. How far is it value-free? To what extent ideologically uncommitted? And at the same time the substantial extent to which science is nonreferential will be revealed.

[2] On its own this does not show too much. For example, it may be that all those who had the appropriate skills were otherwise engaged, e.g. in research at the frontiers, or as dropouts.

[3] For some of these arguments, see Capra 75, chapters 2 and 3.

[4] This does not rule out a correct and complete nonclassical (in fact dialectical) formalisation of Θ. But seen classically, by way of a translation, this formalisation will be either incorrect or incomplete. For let Δ be such a formalisation. By the extensionality theorem Δ will be have a translation t(Δ) which is classical, and which will be either incorrect or incomplete. The simple explanation is that such properties as completeness and consistency are not invariant under the translation: e.g. Δ is not negation consistent but t(Δ) may be.

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corollaries: there is no correct complete extensional formalisation of mathematics, or of science; an extensional account of unified science is impossible, and so on.[1]

Limitations on the classical formalisation of science have been widely recognised. The limitations cannot be avoided in quite the simple way Quine proposed to skirt analogous limitations in the case of mathematics, by appeal to Principia Mathematica. There is no Principia Scientia to provide a similar standard of adequacy in the case of science; but nothing stops us from supposing that someone, Robert K. Bressan say, has written a text Principia Scientia, which presents, in the framework of an intensional logic, all codified scientific theory. It would be an elaborate but routine exercise to translate the text into extensionalese, so that it could be read by those who have not learnt, or are unwilling to learn, the requisite sort of intensionalese (and who sometimes go so far as to claim that intensionalese is meaningless, a claim not so different from the claim that Arabic is meaningless). The extensional translation would suffer from the sort of defects already mentioned in the case of mathematics, that it is parasitic and lacks explanatory power, serious defects Bressan (cf. PLO) has drawn attention to in the case of physics. In sum, the indirect extensional approach, the translation of intensional formalisation into extensional form (with however unanalysed intensional primitives), can succeed, within limits imposed by the limitative theorems. In that sense, science admits of subsequent extensional reformalisation.

In another sense, the direct extensional approach (which admits no worlds or the like), it does not. The argument in the case of mathematics does not quite prove this. For, it may be argued, even if mathematics is not extensional, that does not show that science is not extensional, since it may be that none but extensional mathematics is used, or needed, in science. That may be true of intuitionistic mathematics, but as a general proposition is very doubtful (consider again probability theory, to take just one example). But irrespective of whether mathematics imports intensional elements into science, there are other striking features of science which make the extensionality claim more difficult to sustain than in the case of mathematics.

As with mathematics so in the sciences, the practice is rich in intensional idiom. The sciences also include much factual information expressed in such intensional forms as 'It is not known that p', 'It is an open question whether q', 'No one has managed to confirm that r'. 'It is widely conjectured that s though some scientists do not believe it'. The

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[4] (continuation from previous page)

The classical day of reckoning can of course be postponed by enlarging upon the notion of a formal system, beyond that constructively admitted, and for instance including ω rules and other infinitary principles.

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[1] Owing to an ambiguity in the word 'science' these results are not as clearcut as they have sometimes seemed: in one sense, in which science implies a formalised or organised body of knowledge, the results do not apply.

extensionalist way with such data, insofar as it admits it at all, is the way of metalinguistic reconstruction. Just as mathematics bears little resemblance to the hierarchical result obtained by extensional regimentation, so the empirical sciences would hardly be recognisable after such reconstruction, if it could be pulled off at all. They would have been replaced by something different, by rival theories; but they would not have been thereby eliminated. The extensionalist thesis is transferred to the normative claim that, even if the sciences are not in surface form like that, not hierarchical, that is now is they ought to be. That is not so; that is not necessary. But let's be generous. Let's concentrate upon published scientific theories.[1]

Even so intensional theories abound. The question is: is such intensionality always removable in a direct fashion or not. Let us consider examples where the intensional features appear to be essential.

The central notion in taxonomy is that of a species, and this notion is, and presumably has to be, defined intensionally. John Ray, a leading seventeenth century biologist,

> defined a species, as a group of individuals capable of interbreeding within the group. This criterion, with its corollary that a species is reproductively isolated from organisms outside the group, has survived more or less unchanged to the present day (PC, F32).

What has happened, as the classification of Australian frogs makes evident (Barker-Grigg, p.16 ff), is that additional criteria supplement Ray's basic test, e.g. morphological features, biochemical features, details of mating calls. A fuller account is as follows (Barker-Grigg, pp.16-17; my rearrangement):

> The fundamental unit in animal classification is the species. Many attempts have been made to accurately define a species but it is difficult to establish hard and fast rules. In general terms, the members of a species look alike, have similar habits and, most importantly, they interbreed. ... There are ... many examples among Australian frogs where groups of species within one genus cannot be confidently separated [by]... clearcut features of morphology and geographic distribution ...
>
> If morphological features are insufficient to allow the taxonomist to decide the status of the "species" in question, he may turn to other criteria. The crux of the species definition lies in the idea of a species as a breeding group. That is, any member of the group can mate with any opposite-sexed member of the same group and produce normal and fertile offspring, but the group is reproductively isolated from other species.

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[1] Not finished theories, or there would be little data. For actual scientific theories never really get finished: always someone would be tinkering, trying to include a bit more within the theory. In these terms the logician's ideal of complete scientific theories involves an idealisation far removed from reality. Theory-completeness for scientific theories calls for a very different characterisation from negation-completeness or the like.

The effect of demodalising the species characterisation - from capacity to interbreed to interbreeding - is strikingly illustrated by the case of an aboriginal tribe where members of different tokens are not permitted to intermarry: assuming the restrictions are observed, and they generally were, the totems become separate species under a mere interbreeding criterion. That only shows however, that a straightforward demodalisation fails. The idea is about - though like many assumed analyses it seems to be nowhere worked out in a satisfactory and assessible fashion - that *cans* of capacity and of disposition can, both of them, be reduced to conditional statements and that conditionals in turn are, perhaps, analysable in terms of deducibility of an enthymematic sort. The empiricist literature is full of proposals and projects of this sort. None of them succeed in showing that intensionality can be removed. This large claim is supported by the following small argument (which fortunately can be reinforced by other other arguments: see RLR):- Even if capacity statements can be traded in for conditional statements, the conditionals used admit of nesting. But if conditionals in turn are cashed, somehow, in terms of deducibility or argument relations which admit of nesting, then these also must be intensional, i.e. no direct extensional reduction has been accomplished.

Conditionals and the like (e.g. dispositionals), which are essentially intensional, appear at many places in science. A first example, drawn from ecology, is as follows:- several definitions, for example, 'animal p is a predator or parasite of animal a at time t', 'p is a mate of animal a at time t' take the form C → D, where → represents a conditional and the antecedent C takes the form ξpa_e, namely 'object p is brought into close proximity with animal a at time t, evoking (immediately) some physical, physiological or behavioural response in the animal' (Niven 78, pp.2-3). Were the conditional in C → D extensional, e.g. a material "conditional", such definitions would fail badly, every object not satisfying the requisite conditions being a predator, a mate, or whatever.

The social sciences are, like the life sciences, rich in notions and claims which are intensional. Consider, for example, the notion of *community*, which is important in much sociological work. The classical characterisations (e.g. that of Veblen) make use of the idea of shared goals and values among members of the community; so the notion is intensional. Or consider historical claims as to the beliefs, motives, desires and ambitions of leading historical actors and the way in which these intensional matters figure in the explanation of historical events. Again there are a variety of extensional ways and means of removing prima-facie counterexamples from the social sciences to the extensionality of science, ranging from the tough rejection of the social sciences as really sciences, or as at best tenth-grade sciences, to attempts to analyse the intensional components away. Commonly the reductive analyses are parts of larger reduction programmes, aimed, in the grandest cases, at reduction of the social sciences to the physical sciences and ultimately to physics. It is supposed that if this programme succeeded then intensionality of the social sciences would indeed have been eliminated, since the reduction is to physics, which is extensional. Even if the ambitious programme were to succeed - there are scarcely any cases of success to examine - it faces major objections. Firstly, the requirements on *reductions* usually suggested (e.g. Nagel 61, p.345 ff.) do not require the preservation of intensional properties; so there is no guarantee that intensional features are reduced at all. Secondly, the reduction base, physics, is not extensional.

Theoretical physics and applied mathematics are not in fact extensional; for instance, repeated use is made of such notions as property and relation (it is the physical properties of things that much of physics is about) but extensional replacements are not accepted or acceptable (cf. Thom 79). In the face of examples of these sorts (from respected figures in the sciences) the thesis of the extensionality of science - the main thesis of North American philosophy, as Bressan astutely puts it - is amended in one way or another. A common way is as the requirement that science be extensionally formulable; thus, e.g., Smart (76, p.15):

> ... principles of scientific parsimony will make us demand that science be formulatable in an ordinary extensional logic which quantifies only over things in the actual world ... .

Even if principles of parsimony (scientific parsimony?) did favour extensional languages - which is decidedly doubtful (cf. Carnap as quoted above) - and such selection principles were - mistakenly - taken to eliminate other theory choice principles, still the resulting demand would verge on the normative, on the claim that science really ought to be extensionally formulated.[1] But that is a claim which is readily disputable and legitimately disputed and which may tell us comparatively little as to how science is- or the sciences are, to remove the assumption of uniformity (cf. the claim that weather reports ought to be presented in an extensional language).

In the quest for a defensible thesis, that bears a satisfactory relation to what actually happens in the sciences, the main thesis of North American philosophy gets transformed progressively through forms (A), (A') and (B) reformulated in terms of science or physics (i.e. 'science' or 'physics' substitutes for 'mathematics' or 'classical mathematics'). But then objections like the objections made to analogues for mathematics apply over again. Only, to concentrate now on physics, (1) the examples are different and, (2) there is, as noted, no standard of adequacy, and no development of the extensional programme, to match Principia Mathematica. As to (2) consider Smart's latest proposal (following Putnam) for saving the classical paradigm, for rendering science (i.e. physics) referential, that is in effect existential and extensional:

> The view which I should like to defend therefore is that scientific theories which are confusingly said to be 'about idealisations', are not about idealisations, there being no idealisations for them to be about. They are about real things and are approximately true. ... What is needed to avoid modal logic [or counterfactuals] is a theory of approximate truth (76, p.14).[2]

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[1] Thus too the demand ties with the evaluative thesis: only the extensional is really science - which is as much as to say that only those things really count as science (under the redefinition promoted) that classical extensional theory can take account of some how. The rest of it, even if quite hard, is written off, e.g. as not really respectable enough to be science. This is just more theory-saving. The data the theory is going to admit and take account of is specified in a circular way; for the theory is adopted as a criterion of what is worth bringing out. Only a respectable class of truths is admitted, where the test of respectability is conformity to the theory.

[2] The motivation is: of course the Reference Theory, as is evident from Smart's further presentation: see especially p.13.

But the programme has scarcely any of the requisite development: it is no fit basis to support the large metaphysical load it is expected to bear. There is not even a viable definition of approximate truth of a duly extensional variety (or likely to be?). There are but few illustrations even of how the programme is supposed to apply in physics, and it is apparently not clear how to carry it through even for elementary examples from classical particle mechanics - cases where it can be conceded that extensional formulation of the theory is possible.

The heart of the case that (A) and (A') are false for physics, that physics is intensional, not just as a matter of fact, but in an essential way, lies in examples. As with mathematics there are two important (though not sharply separated) types of examples, firstly competing theories, like intuitionistic mathematics which are somewhat outside the mainstream, and secondly theories which belong to the mainstream or which, like category theory, add to the mainstream. A good example of the first type is classical particle mechanics according to Mach and Painlevé. According to Bressan, who has presented a rigorous formulation of Mach-Painlevé mechanics (in 62, p.142 ff.), 'essential uses of causal implication and postulates of causal possibility are made', i.e. 'the theory of classical mechanics according to Mach-Painlevé is essentially intensional' (Bressan PLO, p.254).[1] Another theory of this type is furnished by the thermodynamical theory of Zemansky 43 (e.g. in the definition of temperature).

As to the second type, causal implication and physical possibility functors occur essentially in classical and relativistic theories of materials, especially in constitutive equations. Bressan explains the matter as follows:

> When such a law [as the second law of motion] ... if at the instant t, $\underset{\sim}{a}$ is the acceleration of the mass-point M, of mass m, and $\underset{\sim}{f}$ is the force acting on it, then $m\underset{\sim}{a} = \underset{\sim}{f}$ ... is asserted, a physical interpretation of it requires a causal implication, I think. However as far as many deductions from it are concerned, this is not essential.[2] However it is essential in constitutive laws when these are used to define constitutive equations in general or referring to a particular material. Hence causal implication is essentially involved in conditions (a) and (b) [of Bressan 78], p.77, in numerous other similar conditions [in 78[3] and] in some textbooks of mathematical physics ..., and in the (intuitive) definition of constitutive assumptions written in [Noll, 73], p.85.

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[1] All the examples from physics which follow I owe, in one way or another, to Aldo Bressan. Quotes from Bressan which are not otherwise referenced are taken from a long and informative letter to me dated November 9, 1978, which also includes a more sophisticated classification of physical theories than that relied upon in the text.

[2] Even where the causal interpretation is not compulsory there are disadvantages in not adopting it, e.g. loss of physical content, physical incompleteness. 'There are different kinds of theories of mechanics. Some ... are extensional and perhaps only use extensional properties. I say that they are modal if interpreted completely, simply because they refer to various possible situations ... when an extensional language is applied to nature some modal notions are at the basis of it ... .' (Bressan, PLO, p.254).

[3] E.g. condition (b), p.164, for elastic solids.

There are of course ways of avoiding some of the causal implications and modalities that occur in natural formulations of physical theories, e.g. by increasing the axioms of the theory, by complicating the primitives,[1] and by replacing definitions. In these ways extensional presentations, of what are really intensional matters can sometimes be obtained. Smart, in effect, recommends just such obscurantism: 'to postulate hypothetico-deductively rather than define counterfactually' or modally, and to introduce complex predicates such as 'is a system of particle mechanics' rather than postulating 'even such mysterious entities as forces and masses' (76, pp.15-16). But once again the proposal is indicated only for a fragment of classical particle mechanics, and even there it would break down (like Quine's proposal which Smart endorses for eliminating talk of forces and masses by way of force and mass predicates) for any application which quantified over forces or masses, as often happens where forces or masses are unknown or not precisely known.[2]

There is one method that can succeed in avoiding, or rather suppressing, the intensional, the method (already considered) of extensional reduction. But since this involves primitives which are usually interpreted in terms of (possible) worlds or cases, the method is decidedly unacceptable, to say the least, to empiricists such as Smart. Nor are fans of worlds and worlds semantics overly-impressed by extensional reduction (see ER). For, among other things, extensional reduction fails to preserve several most important properties, not only paraconsistency, but especially relevant here, explanatory power, intuitiveness, naturalness of axiomatisation and derivations, simplicity of the same, etc. Furthermore, extensional reduction yields only a dependent extensionality, for the extensional formulation is dependent on an intensional original Bressan brings out some of these points (in PLO); he argues that although the modal formalisation of the Mach-Painlevé theory, for example, can be re-expressed in an extensional metalanguage, nonetheless it is false that intensional notions can always be adequately explicated in an extensional metalanguage. Bressan's argument is that the extensional re-expression of e.g., physical possibility is insufficient to account for the meaning of the intensional notion of possibility, and really that the class of situations (or propositions) involved in the semantical analysis cannot be specified independently of intensional considerations. In the case of continuous media physics, much information that would be required for an extensional specification, such as the masses of - and more generally, constitutive equations for - many bodies, is unknown (and cannot be extensionally defined, mass being dispositional).

On the strength of the evidence he has assembled. Bressan concludes that while the main thesis of North American philosophy is acceptable in the weak sense of extensional reduction, it is unacceptable in the strong sense that possible worlds and causal possibility can be dispenced with in science, because

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[1] As Bressan observes, in commenting on Noll 73, 'primitives [with] a very complex mathematical structure ... have to be used when an extensional presentation is chosen. I prefer modal presentations also because they allow us to choose much singular primitives'.

[2] So far no effective methods for removing intensional notions from complex physical theories have been offered - other than methods such as extensional semantics which suppress intensionality into the primitives, e.g. worlds - and more likely methods, such as simple deletion techniques, can lead to disastrous consequences.

(a) without them we cannot have a complete understanding of any physical theory even if it is technically extensional, i.e., in it one works (mainly) considering only one (typical) possible case;

(b) The thesis above in the strong sense, conflicts with the practice of some important branches of physics such as T_{CM} [theory of continuous media] which is not technically extensional: especially in connection with materials with memory ... one is often working with many processes (which belong to different possible cases).

The upshot is then that empirical science is not, especially in its theoretical reaches, extensional. Nor (to advance a slightly more tentative conclusion) can it be satisfactorily reduced to extensional form, even though intensionally formalised scientific theories can be paraphrased - but in a way that fails to preserve crucial properties - in extensionalese.

§4. *Theoretical science is concerned, essentially, with what does not exist.* The question as to whether science is extensional is only part of the question as to whether science is referential.[1] The other main part of the question is: Whether science concerns itself (essentially) with what does not exist, i.e. whether all (genuine) subjects are referring? Again the answer is prima facie, No. As explained, systematic zoology includes much talk of species, families, classes, etc., objects which do not (ever) exist; theoretical physics, quite apart from its reliance on mathematical abstractions, is loaded in every branch with discourse about ideal objects, items which never exist; and so on. Given 'the ancient view' that 'all science is employed about universals' (Reid 1895, p.405), it follows at once from 9.9 that science is about, entirely about, what does not exist. It is enough for the conclusion sought however, what is true, that much science is employed about universals. Given further that much of the remainder of science is about ideal objects which have properties different from anything that exists, much science is about what does not exist.

Again - because the Ontological Assumption produces deep dissatisfaction with this natural and perfectly satisfactory state of affairs - a variety of reductions have been proposed which are supposed to eliminate undesirable non-referring subjects signifying nonentities. But again the reductions are never shown to succeed generally (as distinct from in limited contexts); and they succeed not (as has already been argued in main case: similar arguments apply against special reduction techniques presented in the philosophy of science, techniques which purport to eliminate ideal objects). Theoretical science is thus essentially inexistential.

Since science is inexistential and intensional it is not referential either; it is, so to say, doubly nonreferential. But on any (genuine) empiricist theory - likewise on conventional rivals to empiricism such as idealism - language, especially the language of science, must be at base referential. Thus it can be said concerning the empiricist celebration of physics, and more generally of science, that the empiricist has celebrated too soon, since much of science does not fit comfortably within his philosophy.

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[1] As before, a language is referential if all its (genuine) subjects occur referentially, i.e., refer to what exist and occupy transparent places, i.e. can be replaced salva veritate by identicals.

CHAPTER 11

RUDIMENTS OF NONEIST PHILOSOPHIES OF MATHEMATICS AND SCIENCE

A noneist philosophy of the sciences consists, in large measure, in elaborating and applying the main theses of noneism already defended. A first contentious feature then of such a philosophy of the sciences is its nonreductionism. The theoretical sciences are thoroughly and irreducibly intensional; they are seriously and irreducibly inexistential, i.e. concerned with what does not exist. They are none the worse for these features. The nonreducibility feature colours a good deal of the rest of the philosophies. The motivation to try to reduce many disciplines to something else they are not - e.g. mathematics to logic, theoretical sciences to physics - is thereby removed. But there is much left to be done, especially in explaining how the nonexistent and intensional can enter and how they can help in explaining the existent and the extensional.

The effect of the free admission of discourse about what does not exist without any requirement that such discourse be phased or paraphrased out may be illustrated dramatically enough by an application to the philosophy of mind. According to the account of existence adopted, minds do not exist, because they do not (significantly) have spatial locations; the same holds for mental phenomena such as dreams, but the fact that they do not exist does not imply any of the following things, which are too commonly taken to follow from the claim that minds do not exist:- Firstly, it does not imply that creatures such as magpies and dolphins and celts do not have minds, that each of them has a separate mind which is the mind of that separate body, and so forth. Secondly, it does not imply that minds are physically reducible in one way or another to bodies, e.g. to behaviour of bodies (behaviourism) or to states of bodies (e.g. central state materialism). Thus it does not imply that mental objects such as dreams, images, thoughts and desires are either nothing or else reduce in one way or another.

The effects of free admission of intensional discourse is no less startling, as applications in epistomology (in chapter 8) have already revealed (though evidently, many of the latter effects presuppose the admission of unreduced inexistential discourse, since intensionality commonly relates existents to the nonexistent). Since much of the philosophy of science is an elaboration of epistemology, the effects extend into the philosophy of science. But they also enter independently and, as in the case of theoretical objects, directly.

The material presented in this chapter is rather more sketchy and programmatic than that of earlier chapters. Some of the ideas are presented only in schematic form and not worked out to any extent. The main reason for this is that the area is a frontier one, and noneism is in a pioneer (and sometimes rather primitive) state as regards many of the issues. Nonetheless it seems worthwhile outlining some of the features that emerge from applications of noneism to these issues, especially as they have close and interesting ties with much new thinking by scientists, especially scientists in the life sciences. Nor[1] is the implied criticism of rival positions in the area presented in much detail, though the basis and direction of noneist criticism is often clear. For example, there is no detailed criticism of intuitionism in mathematics, though practically every thesis of intuitionism is, if not refuted outright, modified under noneist scrutiny.[1]

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[1] Owing to limitations of time and energy on the part of the author.

As in the previous chapter mathematics is considered before the sciences generally, partly because the main problems in the philosophy of mathematics have been distilled into a somewhat clearer form than those concerning science, and partly because there are several recent and very controversial questions as to the neutrality of the sciences that are best examined after other issues have been considered.

§1. *Outlines of a noneist philosophy of mathematics.* Noneism has a direct and substantial impact on the philosophy of mathematics. Some of its bearing has already been exposed. Here more is exhibited, and a beginning made on putting it all together.

The orthodox options offered on the philosophy of mathematics - logicism, intuitionism, and formalism - all (with the exception perhaps of Curry's formalism) incorporate referential assumptions, logicism through its platonism and its (inessential) extensionalism and limitation to classical logical forms,[2] intuitionism through its idealism and verificationism (roughly, the meaning of a mathematical statement is given by its method of intuitionist verification, which is its method of construction), and formalism through its nominalism. With the rejection of the standard positions on universals (in chapter 8), then, only some of the theses of the trio of positions on mathematics can be retained. Moreover all the orthodox positions are ontologically restricted, in a way that begins with acceptance of the Ontological Assumption. For instance, Russell's logicism is in part an attempt to show that such central mathematical objects as classes, functions and numbers are logical constructions, and so 'merely symbolic as linguistic conveniences, not genuine objects...' (PM, p.72): the price paid for these conveniences was an admission of the existence of attributes. In contrast, Hilbert's programme of consistency proofs had the object of showing the legitimacy, and thus (it was supposed) existence, of mathematical objects and methods whose existence intuitionism had allegedly put into doubt; while intuitionistic methods were taken by formalists as well as intuitionists as being valid and providing solid conditions for mathematical existence - only the intuitionists for their part construed the methods as not only sufficient but necessary. With the rejection of the Ontological Assumption, then, and the assumption that abstractions exist, the motivation and direction of the orthodox options is removed. Furthermore, with the relevant (or paraconsistent) elaborations of noneism, the irrelevant (or consistency-based) methods of classical and intuitionistic theories are denied universal validity. Thus the rejection of logicism and intuitionism and formalism runs deep.

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[1] It is not too inaccurate to say that intuitionism has won attention and some favour largely because it gave mathematicians and logicians something new to do, in particular investigation of what classically acceptable proofs are intuitionally valid - not because of any intrinsic merits of intuitionistic metaphysics, which are mostly hard to locate.

[2] Strictly in PM, and liberalised only by a little double referencing in the less formal adjuncts of Frege's work.

Standard problem 1 of philosophy of mathematics,[1] the question of the existence of mathematical objects - which of these objects exist? how? where? - vanishes. For the objects in question, though mostly perfectly in order, and completely admissible subjects of discourse, do not exist. Thus there is no need to adjudicate between logicists, intuitionists and formalists as to whether mathematical objects exist as logical constructions in platonic fashion, or as mental constructions, or as formalistic constructions (most often as names): for they simply do not exist. Pure mathematics is, when properly formulated, an existence-free science (see 10.2).

Standard problem 2 concerns the nature of numbers. Numbers are genuine objects, but they do not exist. Because they do not exist there is little point in trying to reduce them to something that does exist, or is supposed to exist, such as numeral words or mental constructions.[1] Numbers are none of the following: linguistic items, numerals, formal objects, human mental constructions,[2] ideas, sets, categories. For they have quite different properties from the items they are supposed to be or to reduce to (as Frege in 50 showed conclusively for several of the cases mentioned). Numbers are not however entirely sui generis: they are certain sorts of properties, properties of certain collectives. The case that numbers are properties is partly syntactical - numerals such as 'five' and 'eight' have a syntax like that of such adjective-nouns as 'red', 'ten o'clock', 'good' and 'beautiful' - and partly logical - that the logical behaviour of number can be adequately accounted for in this way. Roughly, the natural number n is the property of all and only those collectives that correspond one-one with a paradigm collective (independently defined) with n elements (details of this noneist variant of the standard logicist analysis are given in 65, where also the analysis is applied and defended). Set-theoretical reductions of rational, real and complex numbers - which are inadequate to the data - can similarly be revamped in terms of property abstraction.

Numbers, although central objects of mathematics, are only some among mathematical objects; in current mathematics functions are perhaps as important, and there is a wide selection of other deductive items that are studied to varying degrees, e.g., such objects as groups and varieties in abstract algebra, sheaves and stacks in geometry, etc. Indeed every branch of mathematics - which has gone far beyond the 'abstract science of space and number' that the Oxford English Dictionary accounts mathematics - has its own, often distinctive, objects. Thus problem 2 is but a special case of problem 3, the nature of mathematical objects. According to noneism, they are all abstractions, in principle of a wide variety of sorts, none of which exist. There is no good reason to expect that all these objects are analysable in the happy way that various sorts of numbers have proved to be analysable. The intensional objects that mathematicians of the future may well investigate could easily prove intractable to such analysis: in fact such notions as mathematical proposition and conjecture, widely deployed in current mathematics, resist logicist reduction. (But, as we have seen with intensional reductions and will see again with logicist reductions, whether reductions can succeed is highly sensitive both to what counts as a reduction - especially what properties the reduction is supposed to preserve - and to the reduction base given.) Although pure mathematics is an abstract science concerned with abstractions, mathematics can obviously be applied to objects of other sorts, particularly as in engineering to objects that exist. Problem 4, the objectivity of mathematics, is, in part at least, easily resolved given the nature of mathematical objects. Mathematics is objective; for pure mathematics is concerned with the properties and relations of objects, objects which, though they do not exist, are objective, are in no way mind-dependent or tied to a thinking or perceiving subject or to human peculiarities or behaviour or agreement. The objectivity of mathematics has seemed to be in doubt in part because of attempts, under the influence of the Reference Theory, to reduce statements about its objects to statements about something considered referentially accommodable, such as statements about mental phenomena or statements as to or deriving from human conventions. With the failure of the Reference Theory the point of such proposed reductions vanishes; and, in any case, there are sound arguments which show that such reductions are bound to fail. But the issue of the objectivity of mathematics concerns as much the nature of the truth of mathematical statements as the nature of its objects; so the issue will arise again with the problem of accounting for mathematical truth.

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[1] The ordering of the problems is one of convenience. Hereafter 'standard problem x of philosophy of mathematics' will be abbreviated to 'problem x' or 'standard problem x'.

[2] As with phenomenalisms, there is an objectionable anthropocentrism incorporated both in intuitionism, which takes numbers as human constructions, and in one of the main sources of intuitionism, Kantian conceptualism.

The most problematic objects of mathematics are those that threaten the consistency of mathematics.[1] For with inconsistency mathematics collapses, classically and intuitionistically at least; it is rendered trivial. By far the most dangerous objects have been infinitary objects, both infinitely small objects such as infinitesimals and infinitely large objects such as infinite numbers. Problem 5 thus concerns the infinite, both the infinitely large and the infinitely small. The problem is again usually seen as an existence one, but it is really compounded from consistency difficulties; for what is inconsistent does not exist, and both the infinitely small and the infinitely large were threatened by or embroiled in paradoxes known, to some extent, from ancient times. In each case there were two important waves; with the infinitely small the ancient problems of Zeno's paradoxes and the much later problem of the inconsistency of the calculus; with the infinitely large the problems of the paradoxes Bolzano assembled, problems Cantor mostly solved by the simple but important strategy of not transferring intact properties of finite numbers to infinite numbers, and the emergent problems of the logical paradoxes. Inconsistency was of course discovered much earlier in the case of the classical mathematical theory of the infinitely small, the original calculus, than in the case of the infinitely large, where there was no substantial mathematical theory before Cantor's work. The classical mathematical story has been that the problems engendered by infinitesimals were definitively solved by the theory of limits[2] - essentially a potential-infinite solution - although the theory never gave an agreed-upon solution to Zeno's paradoxes or explained what really went wrong in infinitesimal theory. But the analogous resolution of the paradoxes of the infinitely large, the set-theoretic paradoxes, has been resisted by logicists and formalists, though a restriction to the potential infinite[1] was suggested by Poincaré and is characteristic of intuitionism. The intuitionistic position has been that (talk of) the objective or actual infinite does not make sense, the chief reasons for this being of a verificationist cast (cf. PB p.6 ff.), e.g., that an actual infinite or closed infinite totality cannot be experienced. It was partly in response to criticisms of this sort that Hilbert devised his crash research programme for clearing the so-called "actual infinite" through a demonstration of the consistency of classical mathematics, by formalising the object language and proving the consistency in the metamathematical theory using only finitary or constructive methods. As Brouwer pointed out, consistency, even if established (it never was, and classically never can be satisfactorily for rich theories), does not show correctness. The actual infinite worried not only intuitionists and empiricists (since completed infinities are hardly observable) but others; for only the smallest of the infinite cardinals could make any claim to exist on ordinary physical (spatial or perceptibility) criteria for existence, and even it was in considerable doubt since there is little solid physical evidence that infinitely many things exist. One of the views Russell later came to, proposed for PM2, was that mathematics was concerned with the possibility of existence only; and hence that whenever the axiom of infinity (AxInf) was applied in a proof of theorem A, the theorem should be rewritten in conditional form as, e.g., AxInf $\supset$ A. This material form is hardly satisfactory. For if AxInf is true then the hypothesis is unnecessary; as A is true, AxInf $\supset$ A follows; while if AxInf is false, then AxInf $\supset$ A holds anyway, again by a paradox of material implication. What Russell was getting at, though his logical theory had no adequate means of expressing it, is that classical mathematics does not require the existence of an infinite totality, an actually infinite object in the straightforward sense, but only the possibility (not to be equated with the possible existence) of an infinite set (cf. chapter 1 p.12). An elementary Π-Σ reformulation, in terms of possibility quantifiers, of an appropriate sharpening of PM1 (e.g., with the syntactical structure formulated in the style of Gödel's 31 system P) would replace the damaging existential form of AxInf. Nor is there much doubt but that such a system, e.g. P, is consistent though proving it with the usually admitted finitist or constructive resources is classically impossible. Beyond the narrow confines of classically re-formulated mathematics, not even a possible infinite set is required, only that some set (perhaps an inconsistent one) is infinite.

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[1] This should have indicated that the main classical problem regarding mathematical objects was not really that of existence but rather that of consistency. Clearness, distinctness, precision and effectiveness were important in enabling consistency to be seen.

[2] The story is at last beginning to be challenged with the belated advent of new theories of infinitesimals.

Thus the standard problem as to whether an infinite collection of objects exists likewise vanishes under an existence-free formulation of mathematics. The problem is a problem, perhaps not of much seriousness, for cosmology, not a problem (to invoke a facile transfer-of-problems-to-another-discipline approach) for mathematics. For even if, as seems likely (on satisfactory classifications of things), only finitely many things exist, mathematics, being existence-free, is not impugned. Similarly under noneism, several other difficulties concerning the infinite either disappear or are transformed. Talk of infinitely large numbers and of infinitely small magnitudes and of infinite structures certainly makes or can make sense, under the presupposed theory of significance: no category mistakes need be made, and making sense does not depend on empirical or intuitionistic verifiability. A main part of the worry over infinite structures is based directly on the Ontological Assumption: it is that if no infinite structures exist there is nothing at all to talk about and nothing can be truly said (cf. PB, p.6). The worry disappears after the Assumption is removed. Some of the infinite structures of transfinite cardinal and ordinal theory certainly do not exist, since at most denumerably many things exist, but much can truly be said concerning such objects as transfinite cardinals and ordinals, and many properties proved of them.

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[1] The situations were importantly different insofar as the limit theory replaced very much of the theory it superseded, whereas no such replacement of Cantor's attractive theory was proposed, or even possible in terms of restrictions suggested.

The succession of mathematical theories has (as Lakatos 66 has argued) much in common with the succession of empirical scientific theories: an entrenched theory is commonly not given up, or given up only with extreme reluctance, until (at least in the more creditable cases of theory succession) a superior theory, that appears to account for much of the data better, supersedes it: see further 11.4.

Although existence problems disappear, consistency worries remains to perplex the consistent noneist. For infinitary objects are especially apt to generate paradoxes. The less pressing problems concern the infinitely small, the more pressing problems the infinitely large, where variants of the logico-semantical paradoxes directly threaten a comprehensive theory of objects with inconsistency. Noneism can simply incorporate a neutral reformulation of the orthodox calculus and also of recent theories of infinitesimals, in the same way that it can include reformulations of other classically formulated theories (it is again mainly a matter of recasting the underlying quantifier and identity logic). An apparently consistent infinitesimal theory may be obtained by restricting, in one way or another, the principles of classical infinitesimal theory: Robinson's theory (in 70) is just one way of doing this, but the distinction the theory relies upon is rather unconvincing and makes the theory considerably more complex than the classical inconsistent theory. More exciting and appealing, then, at least to the paraconsistent noneist, is the prospect of a paraconsistent infinitesimal theory which includes substantially the whole classical theory; but such theories have yet to be worked out in appropriate detail. (Furthermore, the impact of Zeno's paradoxes in such a framework is unknown.) Such a leisurely approach is not so feasible with issues as to the infinitely large, especially the logical paradoxes. For these paradoxes have a very large impact, for example through the whole of advanced logical theory.

Problem 6 is as to how the logico-semantical paradoxes are to be treated. Various options are open depending on the type of noneism adopted and the extent of departure from superficial neutral reformulation of more classical theory. A more conservative noneism which simply adapts classical theories - these are little more than devices - for blocking the paradoxes is however, even if it should succeed in some limited sense, intellectually unsatisfactory. For such classical devices are characteristically based on assumptions that noneism rejects, especially referential assumptions. The point is easy to illustrate. Limitation-of-size set theories such as Zermelo-Fraenkel suppose that only what is constructive in a certain (liberal) sense exists and that talk about the non-constructive is inadmissible. Accordingly the underlying assumptions conflict with basic theses of noneism, that talk about what does not exist - such as sets, all sets - is perfectly admissible. So while Zermelo-Fraenkel set theory can no doubt be reformulated as a theory of certain sets, namely "ZF-constructible sets", it goes no way towards supplying a full or satisfactory theory of sets. Similarly in the case of other classically-based set theories, e.g. type theories and zig-zag theories such as Quine's systems NF and ML, the motivation is referential. The issue is mistakenly seen as one of determining which sets exist, and of trying to rule out, in one way or another, inconsistent sets. The results, where presumed successful in ruling out inconsistent sets, characteristically rule out much else as well (i.e. the result is overkill), and at best offer, after reformulation, partial theories of certain sorts of sets.

For a philosophically satisfying and non-ad-hoc theory of sets, a route has to be taken (so it is further argued in UL appended), different from any of the options Russell considered in his putatively exhaustive classification of options (in Russell 06), a route which involves changing what Russell presupposed, the classical logical base. For that base is inadequate for radically inconsistent objects, such as paradox-generating sets. The case against classically-based frameworks is even clearer with various of the so-called semantical paradoxes (see Priest 79; and also UL).[1]

Since, on classical approaches, the set abstraction scheme, $(Pw)(x)(x \in w \leftrightarrow A(x))$ with w assumed not free in A(x), leads to triviality in the presence of classical logic, though paradoxes such as Russell's or Curry's, the abstraction scheme has, it is said, to be modified - even if it does seem intuitively correct, the paradoxes prove it is not. But the paradoxes only show that the abstraction scheme leads to disaster in combination with classical logic; and the correctness of principles of the latter used in paradox derivation are less obvious than the abstraction scheme. For is it not obvious that a wff A(x) determines a set, namely the set $\{x: A(x)\}$ of exactly those objects which satisfy A. And is not this far more obvious than the spread principle, $C, {\sim} C \twoheadrightarrow D$, applied in making the Russell paradox, or Cantor's paradox, damaging? Is it not more obvious too than contraction principles, such as $C \rightarrow (C \rightarrow D) \twoheadrightarrow C \rightarrow D$, relied upon in effecting Curry paradoxes? The expected affirmative answers to these questions indicate the route radical noneism takes, namely intuitive set theories and the like based on non-classical logical bases, which are i) *paraconsistent*, in lacking spread principles, and ii) *non-contractional*, in lacking contraction or absorption principles. For independent reasons already alluded to, they should be iii) *relevant* in their quantificational part. These requirements do not uniquely determine a basic quantificational logic for the formalisation of intuitive set theory and intuitive semantical theory (the "naive" theory where the semantical paradoxes arise), but they impose sharp limits on the class of suitable systems (the region of most satisfactory systems is indicated in UL appended; for a much fuller discussion, see RLR).

A philosophically satisfying, and hence uniform, resolution of logical and semantical paradoxes leads then to a radical noneist position, which takes inconsistent sets as they come, as data, as objects of logical investigation, as objects which a satisfactory theory would let one talk about freely. The cut-down to consistent sub-theories, which is not uniquely determined and very likely not effectively determined - the cut-down classical theories are compelled to try and make at the outset in advance of logical theory - can subsequently be investigated *logically*, and leisurely, within the wider paraconsistent theory. Then too, more sophisticated and promising consistent cut-downs can be considered, within the logic, than those that have hitherto been investigated, e.g. the theory of content self-dependence (obtained through designation loops) can be worked out and the mechanism of the paradoxes brought to light, i.e. the precise way in which inconsistency is obtained can be exposed.

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[1] Indeed it can be cogently argued that in the case of the semantical paradoxes there is no satisfactory alternative to a paraconsistent approach: see e.g. Priest 78a.

Such a radical noneist programme is, though non classical, not a many-valued approach. Indeed it is different from any of the many alternative approaches classified in Fraenkel, Bar-Hillel and Levy 73. Although the philosophical viability of the paraconsistent approach is no longer in real doubt, exactly where it leads mathematically is decidedly unclear. Thus radical noneism has a vast research programme, which includes in particular the following parts:

(1) Formulation and investigation of intuitive non-formalised mathematical theories within the relevant paraconsistent framework, in particular

(a) presumably consistent theories such as arithmetic, and the theories of real numbers and of complex numbers;

(b) presumably inconsistent theories such as the theories of infinitesimals and traditional calculus and the theory of transfinite sets, cardinals and ordinals; and
(c) theories which appear to be beyond the scope of main classically-based set theories such as modern category theory.

(2) Establishment, where possible or for partial systems, of nontriviality theorems, and also of consistency results.

(3) Recovering, so far as possible, classical theory within the larger framework, and establishing bounds upon such recovery. (A by-product would be consistency proofs, of a sort, for classical theories.)

Is not the programme, since it has so much in common with Hilbert's programme, open to the same sorts of incontrovertible objections as to Hilbert's, in particular the Gödel theorems? No; the restriction on proof methods that Hilbert imposed are not required; and the Gödel theorems concerned do not extend to nonclassical theories which admit full formulation of semantical paradoxes (cf.UL).[1]

The problem of the semantical paradoxes has stood in the way of a satisfactory semantical theory for mathematics. With the paraconsistent dissolution of the paradoxes the obvious, but previously blocked, solution to the problem of a semantic theory can be given. In principle, the theory of truth for mathematical statements is just the same as for other statements, namely based as a semantical theory where truth is defined in terms of holding in worlds. For example, a truth theory for set theory - and so for as much of mathematics as can be accomplished in such a framework, namely a great deal of mathematics - will yield clauses such as the following for the abstraction scheme: $I(t \in \{z: A(z)\},a) = 1$ iff $I(A(t),a) = 1$.[2] The development of such semantics provides a worthwhile beginning on the next problem.

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[1] These points apply not merely to standard objections to Hilbert's programme based on limitative theorems such as Gödel's, but to objections with a similar basis to logicism: for a striking example of the latter, see Pollock 70.

Problem 7 is as to the nature of mathematical truth. A common assumption of many discussions of this issue is that the statements of mathematics are true. The problem is then to try to explain how. The assumption is however mistaken, and once rectified the problem is transformed to a very different one, that of explaining which mathematical statements are true and accounting for their truth. Firstly, very many mathematical statements are false. Some examples will reveal the sorts of cases, which are especially common where reductions are made:-

i. From standard set theory: each natural number is a member of its successor, e.g. 3 belongs to 4; there exist nondenumerably many objects.

ii. From category theory, which is another abundant source of false statements: there is exactly one set with n elements, for each integer n.

iii. From classical analysis: a real number is a Dedekind-cut (similarly: a real number is the limit of a sequence of rationals; and so on, for other reductions).

These statements are false for the usual reason, they make claims as to how things are which are not so; they are false because they assign to mathematical objects properties which, in the ordinary sense, they do not have. Consider, for example, ii above:- In the familiar senses of 'four', 'set' and so on, we can indicate any number of different abstract sets with four elements. As with the statement "Sherlock Holmes rode into London", there are two interconnected ways of truly affirming, or reclaiming, the relational statement, as such[2] namely

(1) Assign a local context to the statement, so that its semantical evaluation transforms it to something like "In category theory, there is exactly one four element set". Every mathematical statement holds of course in the world its theory circumscribes. Every mathematical statement in true according to the lights of its theory, in the context of its theory (the theory of truth involved is given in detail in 1.24);

(2) Take the statement as literal but about special objects, those the theory circumscribes. Then the category theory falsehood is replaced by the following the truth about categorical sets, "There is exactly one four element categorical-set". The statements of mathematics so transformed

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[1] For a more fully worked out semantics of this sort for paraconsistent set theory see Priest 78. But note that Priest's emphasis on a substitutional interpretation in order to avoid realism is in no way required for the semantics, and from a radical noneist point of view is misguided, since the substitutional interpretation is applied in support of a combination of nominalism and conventionalism, viz. there are no mathematical objects and mathematical truth is a matter of (human) conventions.

[2] If retention of form is not required, there are other options, e.g. the if-thenism of Russell 37 as elaborated by Putnam 67. Lack of a good implication was a crucial reason in Russell's shift away from this variant of logicism; nor does Putnam substitute a good implication for Russell's material connection (only a metalogical version of strict). Given a relevant implication many of the appealing features of if-thenism can by synthesized with the noneist theory elaborated. Many, but not all: for if-thenism is false, as object axioms show.

become statements - necessarily true statements - about objects of their theories, nonexistent objects in the domain of the real world.

One of the logicist theses, that the statements of mathematics are analytic, is based on transformations like these (recursively definable on atomic transformations of the form: $(a_1,\ldots a_n)f \rightarrow ({a_1}^T,\ldots,{a_n}^T)f$, where ${a_1}^T,\ldots,{a_n}^T$ are new objects of the theory, the predicates typically remaining intact). For consider the way logicism aimed to avoid the objections to such statements as "The sum of the angles of a triangle is two right angles", that if space is Riemannian, as the general theory of relativity seems to indicate, then the statement is not true except as an approximation in local cases, but empirically false. Logicism characteristically amends the geometric statement to (the still categorical form): "The sum of the angles of a plane Euclidean-triangle is two right angles" (the replacement of objects being taken just far enough to ensure necessary truth, e.g. 'angle' doesn't have to be replaced by 'Euclidean angle' because Euclidean-triangles provide sufficient determination).

In each case, whether by method (1) or (2), the reclaimed statements are true, and the explanation of this truth is straightforward. Local context statements, as under (1), are true because the world they are evaluated is one where all the statements of the theory hold. Special object statements, as under (2), are true, necessarily, because they are about objects which conform to the theory. To say that the statements are true in virtue of the senses of the expressions involved, is correct, but less illuminating and liable to misconstrual. But is it of course by virtue of the interpretation of the terms as about the special objects of the theory that the statements come out, on the truth theory, as true. Note well that the explanation given is not a conventionalist one; in particular, it is necessarily true that the necessary statements are necessary, i.e. an S4 thesis, $\Box A \rightarrow \Box\Box A$, holds, in opposition to the characteristic conventionalist thesis, $\nabla\Box A$, that all necessary statements are contingently true, because true through the contingent conventions governing expressions.[1]

In sum, *the statements of mathematics*, though not always analytic or indeed even always true, *can be rendered analytic*, true according to the lights of the theory concerned, of its objects. In *this* sense, one of the main theses of logicism (cf. p.11) is correct.

The answer to *problem 8*, *the nature and explanation of mathematical necessity*, is partly set by the answer to problem 7, the rejection of conventionalism, etc. The necessity of those mathematical statements that are necessary can be explained through the semantics, i.e. the necessity is semantically explained. Since necessity is, semantically, truth in all possible worlds, and truth is characteristically determined recursively, it is not too difficult to indicate what accounts for necessity of the statements, namely the objects themselves and their properties. Necessity is the consequence of objects having their properties invariably over a suitable class of world. For example, it is in virtue of the properties of Euclidean triangles in all possible worlds that it is necessary that the sum of the interior angles of a Euclidean triangle is two right angles. It could be said alternatively that it is in virtue of the senses of the expressions 'Euclidean triangle' etc., but this is less revealing, says no more, and is in more danger of being misconstrued, for example conventionalistically.

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[1] There are of course several other objections to conventionalism: e.g. a good objection is developed in PB, p.19. A far-reaching objection to conventionalism is its human chauvinism: see ENP.

Problem 9 is as to *the structure of mathematical theories and the character of mathematical methods*. It is method that distinguishes mathematics, rather than subject matter, although traditionally mathematics *was* distinguished in terms of subject matter, as the science of number and space. But it is perfectly possible to have a mathematical theory or investigation that is entirely independent of space or number, e.g. large parts of Boolean algebra, and much modern algebra. It is the methods that are distinctive. The methods of mathematics are *essentially deductive*.

Thus, the methods are those supplied, in a loose sense, by logic; but methods though logical are applied to nonlogical subject matter, such as air or stream flow, rigid bodies, topological figures, algebraic structures, vector fields, etc. etc. It is, however, final products rather than intuitive processes that should be viewed as deductive in character; and even final accepted products may be gappy by modern logical standards - gappy in two respects. Firstly, much of the reasoning is enthymematic. Secondly, many of the rules applied are incompletely formulated, their precise range of applications (so far) undetermined; and the rules may be weird or even crazy. There are, in principle at least, few or no restrictions on the class of rules that can be investigated, though many rules will not be fruitful, e.g. they will not preserve any prized properties, or lead to stable mathematical structures that may have been independently arrived at in other ways. But some classes of rules will be especially favoured, e.g. those that are requisitely finitist or are suitably constructive. There is, however, no restriction to such rules, and much modern infinitary mathematical logic consists of the discernment and investigation of decidedly nonconstructive rules with "nice" properties.

A mathematical theory has accordingly the following general structure:- it consists of initial postulates, assumptions or axioms - some of which may be incorporated in definitions, from which axioms result by the use of characterisation postulates - together with rules or principles of derivation. The theory includes the closure of the assumptions under the rules, the results being theorems of the theory. In sum, a mathematical theory H may be represented, at a superficial level, as a structure $H = \langle A, R \rangle$, where A is a set of assumptions and R a set of logical rules. This is enough to reveal how a mathematical theory resembles a postulate system. But at a deeper level of analysis the objects of a mathematical theory, the things its statements are about, and other features, would also be revealed. A mathematical theory is not usually a static object but something that changes over time. A dynamic theory is typically augmented by new postulates and definitions, or by new rules, or both (the theory grows by additions in the way that models for intuitionistic logic have made clear). The dynamic development of an initial static theory H_o may be represented by a structure $\langle H_o, K, \leqslant \rangle$ where K is a set of static theories such that for each $H \in K$, $H_o \leqslant H$ and $\leqslant$ is a reflexive and transitive relation on K.

The two commonly noticed components of mathematics, the analytic and generic components, are readily fitted into the framework outlined. The analytic part comprises the working out of the theory in terms of the so far given or received structure, e.g. by deduction of theorems, by formulation of necessary and/or sufficient conditions for important properties, by working to equivalent formulations of the theory or to an exact axiomatic basis for what is included. For a mathematical theory often starts, so it is said, in middle stream, and one can work forward analytically to consequences of the theory, as well as backwards to postulates of the theory. The generic component concerns extensions - some of them conservative - of the theory, the seeking out and investigation of new rules, axioms and definitions. Thus the generic component is that associated with a dynamic theory, much as the analytic component is associated with a static theory.

The unlimitedness of mathematical theorising is a consequence of the infinity (large cardinality) of mathematical theories. The number of mathematical theories and structures of some interest that can be discerned is enormously large. There is simply no prospect, then, of the subject matter of mathematics ever being exhausted by human investigators even over an open-ended time scale. For these sorts of reasons Spengler's thesis (26, p.90) that Western mathematics is exhausted, is entirely mistaken.

> It is enough for the moment that for us the time of great mathematicians is past. Our tasks today are those of preserving, rounding-off, refining, selection - in place of big dynamic creation, the same clever detail-work which characterised the Alexandrian mathematics of late Hellenism (p.90).

The work since Spengler wrote, of Gödel, von Neumann and others, is enough, on its own, to cast very serious doubt on his claim; for new and important directions were taken, not mere detail-work followed out. But even if mathematics had been in the doldrums in the years since Spengler wrote, his claim would be at best accidently true - as it would be if a nuclear catastrophe destroyed all mathematicians, so that no new theories were investigated.

The matter of the basis of choice of theories that are investigated, and the direction developments take, is part of the sociology of mathematics. Evidently, out of the huge range of structures that could be investigated, only comparatively few are studied. Various choice principles are at work: in particular, applications in other sciences are influential, so too are the proclivities of leaders in research.

Problem 10, accentuated by the answers given to earlier problems, is how can mathematics be applied? How are everyday applications made, and how is mathematics applied in the theoretical sciences? For how can pure mathematics, which is about what does not exist, be applied to what does exist, to bridges, rockets, aerofoils, billiard balls, and so on? The answer is in terms of idealisation, simplification and approximation (cf. p.12). Firstly, the behaviour of actual systems, e.g. the actions of physical bodies, may be approximated by the behaviour of ideal objects, which conform exactly to regular principles and which considerably simplify the usually messy actual situation.

> For example, the motions of moon and earth can be roughly approximated by a model of two point particles m_1 and m_2 such that m_1 has the same mass as the moon and is located at the moon's centre and m_2 similarly represents the earth (van Fraassen 70, p.192).

Secondly, actual systems may be conceived as consisting of certain configurations of ideal objects, as for example a black body can be regarded as a system of harmonic oscillators though it does not really consist of such. The nonexistent objects introduced in the approximation to or idealisation of actual systems are those that satisfy known or attainable mathematical techniques, objects that is that are suited to current mathematical assessment. Approximation and idealisation take several different forms: e.g. an object may be replaced by another rather different object such as a point; an object may be regarded as decomposed into several other objects, as is a rigid body into a configuration of points or a circle into a collection of infinitesimal straight lines; an object may be the limit or intersection of a series of other objects; etc. Both methods indicated, approximation and conceptual replacement, could be presented by way of more precise theories, e.g. by a theory of approximation; but the main point is already clear enough, namely that mathematics can be applied to actual things and systems in virtue of suitable relations between nonentities and entities they idealise. (Thus the requisite theories of approximation and idealisation assign a central place to non-Brentano relations.)

There is another dimension as well to explaining how mathematical methods can be applied to empirical subject matter: that is the logicist account of the application of mathematics, which should be integrated with the account in terms of approximation and idealisation already indicated. Logicism explains very nicely how empirical inclusions can be derived from empirical premisses by principles of logic: the underlying fact is

> that when we assert that a principle of pure logic is 'valid' we thereby assert that the principle is good under all substitutions for the predicate letters A,B,C, etc.; even substitutions of empirical subject matter terms (Putnam 67, p.289; where the point is also usefully illustrated).

The answers to earlier problems enables more to be said on what is right and wrong about logicism and its standard rivals, intuitionism and formalism: call this bundle of issues problem 11. To some extent the problem is really part of a more general problem, a problem already addressed in the previous chapter, to which noneism need attempt no very full answer, namely the scope and nature of mathematics. The practice of mathematics alone is enough to reveal the inadequacies of standard positions. The practice is not of course sacrosanct, beyond criticism, and has commonly been regarded, correctly, as far from sacrosanct. Even so, the practice is obviously not restricted in the ways intuitionism, and differently formalism, suppose. Legitimate practice is obviously not restricted to the study of formal systems or to that and metalogical investigation and in fact rarely consists of such things. Nor is it restricted, nor need it be restricted, to the things, certain mental instructions, and methods that the intuitionists regard as admissible. A mathematical investigation may use any mathematical methods and consider any postulates; and mathematical theories may be discerned and designed with a similar freedom.

But what is wrong with formalism and intuitionism runs wider and deeper than this; indeed it is not going too far to say that most of the leading theses of formalism and intuitionism are defective.[1] The more deeply entrenched troubles derive firstly from the presupposed human chauvinism (see ENP)[2] and secondly from the Reference Theory (as already explained). In particular, the objects of pure mathematical theories and studies are not entities of any sort, e.g. they are not formal objects such as symbols or other counters. They are objects which do not exist but which nonetheless have definite mathematical properties, properties which are assigned their characterisation by characterisation postulates (or object axioms) of the intuitive logic, the mathematical investigation of the objects being carried out by a given or chosen (and perhaps informal) carrier logic (cf. the explanation of how mathematics is possible on p.47). The picture is thus a noneist elaboration of postulate theory, as illustrated in Church (56, p.317ff.), a picture which commonly permits logicistic transformation (as Church goes on to show).

Since logicism, like Hilbert's formalism, is built on classical logic and likewise assumes the Reference Theory, how is it that logicism obtains more favourable consideration then formalism, and weakened versions of central theses of logicism are brought out (see, e.g. pp.11-12 above). An important part of the answer is that main theses of logicism are not tied to a particular logic (this is also the case, to an even greater extent with formalism; but not with intuitionism), and that these theses are by no means as objectionable when freed from a referential background. Furthermore, once cut loose from that background, most of the objections to the theses ((i) and (ii)) of logicism (stated on p.11) can be met (as noted on p.12). For the textbook notions of classical mathematics (pre-1911 consistent neutral mathematics) can be expressed in neutral attribute logic (as, for the most part, PM appears to show), and the truths concerning those notions can be proved in that logic (which of course contains choice principles, and allows for the assemblage of infinitely many objects). In addition, the axioms of the logic are analytic, provably so (in an S5 sense) when the logic is properly modalised, and the logical rules preserve analyticity. Along these well-enough known lines logicism as formulated (essentially Church's formulation) can be defended.

> But this weak form of logicism, while mathematically interesting [and]...true..., is not philosophically interesting....The only philosophically interesting version of logicism is the strong form which refers not just to the concepts of classical mathematics, but to all mathematical concepts, and asserts they are all definable in set theory. This strong form of logicism is false (Pollock 70, p.392).

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[1] The requisite documenting of this large claim will have to await a further elaboration of noneism in the philosophy of mathematics. Some of the points, those that do not question the Reference Theory, can be tracked down (they are widely scattered) in the literature; e.g. on intuitionism, see Russell 37.

[2] There is nothing quint essentially human about mathematics, its objects and methods, or about mathematical activity. As it happens, the mathematicians we know of are human; and it is some of them who choose from the infinite variety of objects and of logics, the objects they consider worth and investigating and the methods by which to do it.

While Russell did advance a strong form of logicism (e.g. 37, Introduction), the weak form is of considerable philosophical interest; it appears to refute many philosophical claims, e.g.

> it does, I think, show that there is no sharp line (at least) between mathematics and logic; just the principles that Kant took to be 'synthetic a priori' (e.g. 'five plus seven equals twelve') turn out to be expressible in the notation of what even Kant would probably have conceded to be logic (Putnam 67, p.289).

Nor did Russell - or, for that matter, other leading logicists such as Frege and Church - demand a reduction to set theory (which is questionably logic). Thus Pollock's demonstration that 'logicism is incorrect' (p.388, p.389) misfires, since it at best shows that a certain function is not definable in set theory. Moreover it is far from evident that in a larger logical framework (which deals more satisfactorily with logico-semantical paradoxes than the classical framework) Pollock's argument would succeed.

§2. *Noneist reorientation of the foundations and philosophy of science.* As remarked, much of the philosophy of science is a replay of epistemology, much of the remainder a replay of metaphysics (the point is especially evident from the presentation of Harré 72). A corollary is that much philosophy of science is buggered up by mistaken epistemology (especially reductionism and scepticism in perception theory) and much is distorted by bad metaphysics. The metaphysical replay is well illustrated by the issue as to the status of theoretical entities, where the standard positions are like those on universals. The epistemological replay is evident in philosophical theories as to the nature and status of scientific knowledge, theories which at the same time try to account for scientific truth, insofar as it is obtainable, and for the allegedly puzzling character of scientific theories and theoretical statements. Because the problems and positions are a replay, noneist rejection of all the set (i.e. standard, entrenched) positions on main issues in the philosophy of science is accordingly to be expected, and occurs. The standard positions that get rejected are of course predominantly empiricist, now standard alternatives being furnished by Marxist philosophies of science.

It is a curious fact that empiricism, which is the philosophy invariably linked with science and its promotion and commonly thought to provide the foundations of science, has great difficulty in explaining how theoretical science is possible at all, and indeed fails to do so, even on charitable interpretations of what it can provide. Empiricism is not alone in failing to answer the Kantian question (cf. 34, p.36): How is theoretical science possible? Kant's own modification of empiricism, a sort of idealism (according to which knowledge arises not merely from experience but from experience or impressions processed by human faculties[1]),

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[1] Kant's theory is flawed by a pernicious human chauvinsim; with its tremendous emphasis on human faculties and human knowledge it fails to explain animal knowledge. However the theory could be modified to account for animal knowledge, by extending the faculty theory to animals, where howeven it looks even less plausible.

The empiricist cast of Kant's position, which does transcend empiricism, begins to emerge with the very first sentence of the body of the pure

(continued on next page)

likewise fails - even if it were successful it would land us in a form of scepticism. So also does traditional rationalism, insofar as information derived from nonexperimental sources is reduced to intuition (or to a referential base). The failures are in each case due to the attempt to account for theoretical science in referential terms.

The modern Marxist critique of empiricism, and of rationalism, need not detain us; for the alternative the Marxist theory offers - a production line "theory" of knowledge (cf. PT, p.38): it is really little more than a suggestive comparison - fails to address itself to the main issues (or most other problems of interest that will emerge). It is a truism of course that science is, in one sense, a social product: that does not mean that it is not open to an individual to check its wares or to improve or extend them. But that there is an ongoing process of accumulation or modification of theoretical knowledge simply avoids the question of how, what almost everyone knows somehow happens, namely theoretical science proceeds, does happen. However modern critiques of empiricism, from Marxists from idealists and also from nihilists (sceptics) such as Feyerabend, do usefully reveal how many of the problems that have exercised philosophers of science are the product of positivism (though these critiques are often misguided, being directed against the wrong features and not against some of the fundamental faulty features of empiricism). It is fair to say that philosophy of science has been, until very recently, the last conspicuous stronghold of positivism in philosophy. To be sure, positivism lurks elsewhere throughout philosophy but in a much more disguised and less blatant form: there is no parading, or even flaunting, of positivistic assumptions (as there still is in the social sciences), but instead the assumptions are more subtly infiltrated.

On empiricist assumptions theoretical science can be couched in a language which is referential, which conforms to the requirements of classical logic, which is about only what exists (i.e. what is observable) and which is extensional, and so value-free. If scientific theories are not expressed in such a form then at least they must be reduced to such a form. Therewith a vast program of reduction and analysis - most of which has never been carried out, and much of which cannot be carried out in the way planned - is presupposed; for instance, reduction of intensional claims such as those of laws, dispositionals and counterfactuals to extensional surrogates, of claims about nonobservables and nonentities to claims about observables, and even, with more extreme forms of empiricism such as operationalism, of all claims to claims concerning operational statements, i.e. statements describing certain minimal laboratory operations (a much exaggerated version of the reduction of all geometrical constructions to ruler and compass constructions).

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[1] (continuation from page 16)

Critique (34, p.25):

> There can be no doubt that that all our knowledge begins with experience ...

Kant's two stage account of perception and perceptual knowledge, in terms of impressions perceived by human faculties, is open to the same damaging objections as the similar modern view of perception in terms of raw data plus interpretation, a view criticised in 11.3.

The upshot is that theoretical science is said not to be in order as it is[1] - the real reason for this being that it does not conform to strict canons of empiricism. It is in need of rational reconstruction, which the empiricist program is designed to supply. This reconstruction program loses much of its interest once it is realised, first, that some of the theoretical sciences said to need reconstruction are more or less in order logically and linguistically - they may be out of order in all sorts of other respects, e.g. various of the theories are a mess - secondly, that a reconstruction program is not required to justify ongoing activities and language, and thirdly, that the problems that are detected are not problems of science but problems of empiricist strictures.

The rejoinder to the initial question, as to how theoretical science is possible, is thus that it was only in doubt because of referential strictures. Without such strictures it is perfectly possible to carry on investigations of what does not exist, such as ideal objects, and what is intensional, such as scientific laws, and thereby of theoretical science. Such investigations are moreover intimately bound up with the real empirical world, insofar as the aim is to devise - by far exceeding empiricist bounds - true theories concerning what does exist and what does happen and how it does and why it does.

Furthermore with a different (noneist) approach from a different perspective, many of the standard problems discussed in the philosophy of science vanish. They are problems, that is to say, induced by an empiricist frame-of-reference - or, more generally by the Reference Theory. Let us locate some of the standard problems in the philosophy of science and consider how they are transformed under the change of perspective. Though it is convenient to try to separate the problems, it will become clear that many of the problems are so not isolated from other problems (so it is not enough to try to avoid the Reference Theory in just a piecemeal sort of way.) As always there are two main classes of problems generated by the Reference Theory.

(A) Existence problems. According to noneism, many of the objects considered in theoretical science, the objects of scientific theories, do not exist and do not need to exist, e.g. all the idealised objects of physical theories. They may have physical properties and (full) relations nonetheless: and they acquire their properties primarily in virtue of assumptions of the theory, by characterisation postulates. Many objects of scientific theories which are not observable also have physical properties, though they may acquire some of their properties differently, namely in virtue of existing. All these objects are however thought baffling, capricious, the product of superstition or worse, to those who have bought the Reference Theory in empiricist form[2]. Hence arises

(A1) The problem of theoretical entities, which is commonly a problem of nonobservable objects. The problem, which is generated by the Ontological Assumption[1] is as follows:-

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[1] Rival views which claim that theoretical science is entirely in order as it is, even when the practice is, as in some modern examples, methodologically unsound to a far from negligible extent, are criticised in 11.5.

[2] That is, with what exists empirically determined - as opposed, e.g., to platonistically determined as a rationalist may allow.

1. Scientific theories contain many statements (some often true) about objects which are not observable.

2. Only what is observable - or reducible to observational terms, on a wider construal - exists.

3. The Ontological Assumption. Therefore, by 2 and 3,

4. There are no true statements of scientific theories about nonobservable objects.

The problem is another empiricist generated problem. There are two mistaken premisses, 2 and 3, and with the rejection of those the problem disappears. So also does the motivation for, and much of the interest in, instrumentalism - though a residual linguistic interest remains, as for instance with the issue as to what extent, and with what losses, can we prune our theoretical vocabulary. (Compare the problem for speakers at international conferences: to what extent can one get by with basic English and paraphrases one can make using it).

(A2) The problem of mathematical entities and abstractions. Sophisticated modern science draws heavily on mathematics in formulating its theories and deriving consequences of them. And the mathematics used makes heavy use of objects that are not observational-type items and which, on the face of it, and after further investigation, do not exist, e.g. abstract sets, real numbers. Science also has frequent recourse to other abstractions, objects that have no place in modern extensional mathematics, namely properties and relations of one sort and another, e.g. disjunctional properties.

Although the mathematical objects figure in a different way from the sorts of theoretical objects science itself supplies - objects which for one reason or another are not directly observable such as genes, microparticles, photons, and objects which do not exist such as idealised particles, planes, bodies, frictionless surfaces, etc.- they cause similar problems for empiricism. They commonly force a modification - really a rejection of pure empiricism - in the direction of a qualified platonism: Thus, for example, the Quine-Smart position, which takes those sets required by the mathematics of physics to exist but which allows no attributes to exist, and the Armstrong-Tooley position, which takes the attributes thought to be required for science to exist but which admits no sets as existing. (Each is right only about what they contend does not exist.) Again the problem is permissed on acceptance of the Ontological Assumption and vanishes with its rejection.

(A3) The problem of Space and Time. If Space and Time are considered as universals, the problem is like the previous one, like that of universals generally, and resolved in a similar fashion. But often - and this compounds the problem - Space and Time are construed as particulars. In fact, like world, space and time admit of various related construals. Whether as a particular (Real) Space exists depends on which particular it is taken to be. Time is different, since (as explained in chapter 2) even as a particular it will include particular components, purely past and future instances, which do not exist (now).

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[1] There are variations, on the argument, meaning forms, which rely on the Verification Principle:- Only terms which are experiential or expressible as such, have a meaning (Hume). So theoretical terms have no meaning. But the premiss (a version of Verification Principle) is false.

(A4) The problem of the objects of failed and false theories. The history of science is littered, as they say, with failed theories, including theories that were about, or purportedly about, objects that did not exist, luminous ether, phlogiston, etc. The first problem is said to be to explain how such theories make referential sense, i.e. how serious investigation of such theories can be explained. The main problem however, is that many of the theories that we confidently adhere to may be of the same character as those of our ancestors, i.e. they may be about things that do not exist. Their predicament, of theorising about nothing, may be ours also (as Rorty 76 has nicely explained).

The first problem is no problem at all for noneism, but provides a fragment of the case for the position. One can perfectly well talk, sometimes truly, about what does not exist, i.e. about nothing actual. Serious investigation of such theories is likewise easily explained. Sometimes the investigators mistakenly thought the objects investigated did exist; sometimes the objects sufficiently resemble objects that exist as to repay serious study; and so on. For similar reasons the main problem is only a predicament given referential assumptions. To be sure, there remain other problems, e.g. the objects of false theories are in many respects like those of myth, and attributions them may not sustain inferences which would be legitimate were the theory true; and our theories like theirs may be false, they may not even always be better approximations to what is true.

(A5) The problem of theories generally. Likewise removed is the problem of the existence and placement of theories, laws, problem situations, etc., that leads Popper to introduce a Third World resembling Plato's World of Forms and leads Althussarians to try to place theories as a real part of scientific practice (Chalmers 76, p.140). For theories do not exist, either in a different world, or - somehow (in a holistic operational fashion?) - as a part of the scientific production process.[1] The puzzling linkage between theories and the world of physical entities, to explain which Popper invokes the mind as a mediator (72, p.155), and which Chalmers (p.140) suggests is to be explained - again how is not made clear - by scientific practice, also ceases to be puzzling. For there is no question of reconnecting disconnected worlds (since theories do not exist someplace) or of fitting objects into a theoretical production process. Since explanation is an intensional matter what does not exist can unproblematically explain what does exist and what does happen.

(B) Intensionality problems. According to noneism many of the fundamental notions of philosophical interest to be accounted for in theoretical science are intensional, notably explanation, cause, evidence, confirmation, probability, counterfactual, dispositional, law, theory. The intensionality of some of these notions is recognised to some limited extent by referential accounts, but there is an attempt to reduce all these - by initial reductions to deducibility and probability relations, these in turn being referentially analysed at the metalogical level - to extensional notions.

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[1] Again, it is true, rather trivially so, that the production of theories is an important part of scientific practice, but it is not distinctive of science, e.g. it holds also for such practices as philosophizing and literary criticism. And that truth does not solve, but simply avoids, Popper's referentially-generated location problem.

(B1) Explanation. a frequent objection to noneism has been that nonentities cannot explain the behaviour of entities. But if explanation is an intensional relation the strength of the objection is dissipated; because of course entities can stand in intensional relations to nonentities. And why shouldn't explanation be one of these? Indeed it seems certain that it is. On the kinetic theory of gases, to take an example, properties of an ideal gas, to which actual gases approximate, are explained in terms of statistical behaviour of a collection of perfect molecules, none of which exist: the details are those of the kinetic theory. Similarly with the model of black body radiation, the classical accounts of solids, even the basic particle theory of Newtonian physics, since the particles assumed (with mass and velocity and no dimensions) do not exist. In sum, behaviour of assumed objects which do not exist is explanatory of the behaviour of things that do exist. Certainly the nonentities reflected upon are in requisite physical respects like the entities whose behaviour they account for: why not? Nonentities can have such properties; that does not make them exist.

The explanation relation so far considered takes the form:
that ys have such and such properties explains that x has property f.

where the y's in question may not exist. The more general form of explanation relations is thereby foreshadowed, namely

MF. that A explains that B,

where A and B are (declarative) sentences. Thus MF represents explanation linguistically as a predicate of sentences or of statements (or on the metalinguistic view names of sentences), depending on how the that's are disposed. The main form, MF, is by no means the only form explanation connections can take: 'explain' can link objectives, e.g. 'the red chair's looking purple is explained by ...', properties, e.g. '--- explains the blueness of the sky', events, and mixed cases, e.g. 'a broken axle explains my failure to arrive on time'. And there are a range of other forms, e.g. 'Alfalpha always explains the theory more clearly than I do'. There are methods of paraphrase, of varying degrees of adequacy, aimed at reducing the further forms to the main form MF. As far as the central issue is concerned however we can concentrate on the main form.

Explanation is an intensional relation, on both relata, as examples show; consider e.g., 'that light rays passing the sun are bent in accord with relativistic predictions explains that a precessing of the perihelium of Mercury is observed' (a rather forced way of stating the connection). Replace either antecedent or consequent by a truth-functional equivalent, or for that matter by a strict equivalent, and truth need not be preserved; e.g. suppose it is true that modern birds evolved from the dinosaurs and replace either antecedent or consequent in the reductionistic explanation example by 'modern birds evolved from the dinosaurs'. The result is irrelevance and falsehood. Thus explanation is not extensional at all. That is, the following connections are rejected (when MF is now abbreviated A EX B): $\dashv (A \equiv C) \,\&\, A \text{ EX } B \supset. \, C \text{ EX } B$; $\dashv B \equiv D \,\&\, A \text{ EX } B \supset. \, A \text{ EX } D$. Nor, equally importantly, is the relation modal, i.e. replacement cannot be recovered by supplanting material equivalences of A and C or B and D by strict equivalences. This is evident from mathematical examples: the universality of Pythagoras' theorem was eventually explained by theorems of Euclidean geometry, but it was not explained by the law of identity as a modal account would have. The modal failure also bears directly on more empirical cases. For A is strictly equivalent to A & T where T is any necessary truth. Were modal replacement correct relativistic effects would explain the observed precessing *and* 2 + 2 = 4. But presumably, A EX B & C implies A EX C, so relativistic effects explain, on the modal view, 2 + 2 = 4!

There are several corollaries. Firstly, explanation *is* a serious problem for empiricism and, more generally, for referential theories, because it is intensional. Thus reduction is essential if explanation - a crucial feature of what science is supposed to offer - is to be accounted for. Secondly, the reductions that have been proposed are inadequate. Consider the best known reduction, the covering-law model, popularised by Hempel. In its initial form (the objections extend straightforwardly to later refinements) it goes like this: A EX B iff, for some set of scientific laws and background truths (initial conditions) $P_1,\ldots,P_n$, B is deducible from A together with P_1 through to P_n, i.e. in symbols $A \,\&\, P_1 \,\&\ldots\&\, P_n \Rightarrow B$. This already encounters a good many problems, much discussed in the literature, e.g. some historical explanations are presumably correct but history furnishes (despite Hegel and Marx) few, perhaps no, covering laws. But such problems are not the immediate concern, which is that deducibility is already an intensional relation (and not, as it is rather easy to see and as RLR explains, a modal one). Deducibility has in turn to be reduced, extensionalised: something that has been attempted by the metalinguistic theory, formalised by Tarski and developed by Carnap and others. But the account, since essentially (first-degree) modal, makes explanation modal also, which is wrong. There are obvious connected faults, e.g. the covering-law model as presented delivers paradoxical results, with - what is false - any statement at all explaining a scientific law.[1] Finally, there are more technical, but nonetheless significant, faults; for example, the metalinguistic account excludes nesting of the explanation relation, yet such nestings as A EX (B EX C), A explained B's explaining C, make perfectly good sense.

Again the difficulties are mitigated with noneism. Intensional relations stand in need of no reduction in order to be in order. Explanation is a further relation to be investigated in its own right, without requiring however - what looks increasingly unlikely - a reductive analysis. Some of the elementary logic of explanation we can already supply within the framework of relevant logic; and the principles which hold enable an attractive semantics to be furnished.[2] In particular, the following principles hold: $A \text{ EX } B,\ B \Rightarrow C \rightarrow A \text{ EX } C$, where $B \Rightarrow C$ reads 'that B entails that C'; and $D \Rightarrow A,\ A \text{ EX } B \rightarrow D \text{ EX } B$. Hence, e.g., $A \text{ EX } B \,\&\, C \rightarrow A \text{ EX } C$; and a basic logic emerges. Even so quite elementary principles are still in dispute. Certainly $A \text{ EX } B \rightarrow A \Rightarrow B$ fails, but to what extent does $A \Rightarrow B \rightarrow A \text{ EX } B$ hold. The trivial explanation A EX A is surely degenerate - this could be avoided by adding the premiss $B \not\Rightarrow A$ - but what of (A & B) EX A, (x)A(x) EX A (t) etc., which only barely (if at all) avoid triviality? The logic of explanation does not seem sharply enough determined to resolve these questions. A way around the difficulty is to introduce initially a wide undifferentiated notion of explanation which includes trivial explanations, and then to make distinctions within the kind between elementary logical explanations and substantive explanations. For the elementary logical explanations can be worked out using the account of deducibility.

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[1] Thus an improved account of deducibility alone is not going to save the model: more far-reaching changes are required.

[2] Appropriate details are given (once again) in the companion volume RLR, chapter 7.

The order of intensionality of explanation is (like many other central notions in the philosophy of science) of the order of entailment, not modal, but not of as high an order of intensionality as such notions as belief and assertion which are not closed under entailment relations. This order of intensionality determines the basic logic and semantics of explanation, e.g. the worlds involved in the semantical analysis are those used in the analysis of entailment.

The intensionality of explanation can be applied to show how science can explain. Explanation is intensional: but so is science, so explanation in science is certainly not excluded. The matching intensionality is in fact the reason why science can explain, and not merely describe. In this way a modern puzzle, which has been used as an objection to science, that science can only describe, not explain, can be resolved. The puzzle arises because description is taken to be referential, given only in narrow this-worldly forms, because it is thought that all that science can include is of this type. Explanation being intensional lies beyond its scope. The resolution, already argued for, is that science is intensional. It describes not only how things are, but how they would be in various alternative worlds. In this way it can offer genuine explanation, and assertions that are deeper than constant conjunctions.

In an attempt to defend science against critics who object to science - or at least to empiricist restricted science - on the ground that it fails for one reason or another to offer genuine explanation, Passmore (78, p.11 ff) attempts to dispose of such critics as wanting more than can be expected and in particular of expecting anthromorphic explanations. But the critics, in expecting intensional science are not expecting more than science can offer, and they are not always thereby expecting anthromorphic explanations. Passmore has, to summarise his moves, equated intensionality with intentionality and construed the latter anthropomorphically![1] Such critics are rightly looking for some than merely mechanistic extensional science, and more, much more, can be expected, and is not uncommonly supplied. Once the intensionality of explanation is seen, such mistaken equations as Passmore's are seen to be in no way required. While the world may described to some limited extent extensionally, intensionality is essential for explaining and understanding the world.

The intensionality of explanation is, of course, only one of many issues that surround the central issue of explanation in the sciences. Other issues, upon which noneism bears, that will not be tackled here include: When are explanations good, adequate, genuine? What types of explanation are of this sort? Can the wide variety of forms of explanation, or adequate explanation, be reduced to a limited number of canonical forms? Can everything be explained or are there some ultimate unexplainables?

Much of what has been said concerning explanation applies also to the following, otherwise very different, central notions in the philosophy of science:

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[1] Really this is not so surprising: the allied equally mistaken attempt to make all intensionality somehow mental, and then reduce the latter to referentially-acceptable features of humans, is philosophically pervasive.

(B2) Cause, causal explanation.

(B3) Conditional, counterfactual, dispositional.

(B4) Law, lawlike statement.

(B5) Theory.

(B6) Verisimilitude.

(B7) Probability, confirmation.

None of these notions is extensional; all are, as well as inexistential, intensional; all concern what happens not just in the actual world but in many alternative worlds as well, and often as regards what does not exist. But none are modal, a fact that rules out most of the standard philosophical accounts that do not erroneously aim for an extensional analysis. Most of the notions are of the order of entailment. None are of as high an order of intensionality as that of belief, contrary to an assumption sometimes made in the explication of probability and of conditionals. Relevant analyses of many of these notions and criticism of rival irrelevant analyses may be found in RLR; probability is however considered in UL (appended).[1] At this point the text has to join forces with what is presented in RLR, namely the case for, and shape of, such explications.

§3. *A noneist framework for a commonsense account of science.* Much recent philosophy of science has been diverted from commonsense answers to main questions and indeed thoroughly vitiated by

(1) a heavy injection of epistemological scepticism, and

(2) a reliance on classical logical theory.

These have of course a common source, namely the Reference Theory. As a result of (2), for example, explication after explication of a commonsense or intuitive type has gone bad; examples are explication of content, probability, empiricalness, verisimilitude (cf.§3). In each case, accounts conservatively extending and explicating initial commonsense views can be restored by transcending classical limitations, a point that has already been clearly glimpsed.

At least as damaging to commonsense has been the effect of scepticism (1), which has, in particular, issued in a thesis of fallibility, that all (scientific) knowledge and all observation statements are fallible, and a thesis of theory-dependence, that really there is no separable class of observation statements, that all so-called "observation statements" are theory-dependent. These two theses have been applied in the new philosophy of science - Chalmers 76 is an excellent illustration but essentially the same points can be found in the work of Feyerabend, Kuhn, Lakatos and others - to destroy or erode many facets of commonsense accounts of science. For example, to erode the following principles:-

CS1. Science starts from, is based on, veridical observation.

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[1] Preliminaries for a relevant account of verisimilitude may be found in Mortensen 78. But more work is called for on this important (and even from a relevant viewpoint, difficult) topic.

It should be observed however that the 'starts from' terminology, as well as being insufficiently explicit, is open to misinterpretation. For it can suggest, what is not intended, a Baconian account of science, where theories emerge from the accumulation of observations. To say that science is based on observation is not to say that sophisticated theories are arrived at by generalisation from observation (on the contrary 'new theories are conceived of in a variety of ways and often by a number of routes' Chalmers 76, p.32); it is not to deny that observation and experiment in science are often guided by theory; it is to say rather in terms of what grounds scientific theories are appraised and justified, and also on what more basic empirical generalisations are premissed.

In the end, Chalmers himself relies on an observational base, though in more tentative fashion than need be: for according to Chalmers (76, pp.57-8) even observation statements may be tentatively accepted and provisionally retained, as long as theoretical developments do not require their rejection.

CS2. Veridical observation yields a secure basis for the derivation of scientific knowledge.

CS3. The primary aims of science are truth and explanation;

a little more specifically, a primary objective of scientific investigation and theorising (and, more generally, scientific practice) is to give a true account (or description) and explanation of reality, i.e. of the actual world. Commonsense is not however committed to unworldly views about scientists, such as Popper's naive view: 'the scientist aims at a true description of the world' (69, p.114; cf. also 72, p.40).

CS4. There is a direct relation between scientific theories and the real world such that those theories are better or worse descriptions of "what the world is really like",

(Chalmers 76, p.114: Chalmers calls the position realism and subsequently, in contrast to his own pluralistic realism, simple or naive realism.)

Theses CS1 and CS2 are two of the three that make up what Chalmers calls 'naive inductivism' (76, p.12).[1] Each of the theses CS1-CS4 cited, and much else, falls before the objections from fallibilism and theory-dependence; for example, according to Chalmers (p.114) simple forms of CS4 are rendered untenable by 'the fallibility of scientific knowledge in general and of observation statements in particular'. Indeed the whole argument of Chalmers 76 - which represents well one of the recent new waves (or ripples) in the philosophy of science - relies very heavily on the theses of fallibility and theory-dependence; and so, much of the criticism of Chalmers 76 and most of the arguments directed against commonsense claims are removed when the case for the theses of fallibility and theory-dependence are removed. For these theses are appealed to repeatedly in the course of Chalmers' dismissal of natural and commonsense answers to questions in the philosophy of science - not only in the rejection of CS1-CS4, but, for example, (p.123) in trying to raise doubts as to whether 'the notion of truth or correspondence to the facts makes sense for observation statements', and (pp.124-5) in trying to manufacture difficulties for the notion of closeness to the truth of theories.

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[1] The third thesis is that 'scientific knowledge is derived from [veridical] observation statements by induction'. The thesis lacks commonsense character, partly because of the involvement of the somewhat technical notion of induction and partly because commonsense certainly appears to allow for the further testing of generalisations reached by induction before accounting them knowledge. On this point, as on the forms of inductive argument that he considers, Chalmers' account of induction is seriously defective.

The qualification, veridical, has been inserted where Chalmers has none both above in the third thesis and in CS1; but by 'observation' Chalmers means 'veridical observation'.

What supports these undoubtedly powerful (i.e. destructive) theses of fallibilism and theory-dependence? Nothing substantial, but primarily sceptical arguments - so it will now be contended, by way of examination of Chalmers' elementary, but nonetheless representative, case for the theses and against CS1 and CS2 (76, chapter 3). The preliminary softening-up process in Chalmers, as in much of the other work defending fallibilism and theory-dependence, consists of an attempt to remove direct realism in favour of some indirect theory, by a series of contrived examples. There is said to be a gap between what is observed, and what is recorded in an observation statement, and what is directly had in sense perception, and all that is secure is the latter. Chalmers simply identifies what observers see and the subjective experiences that they undergo (pp.23-4),[1] and claims, without any argument, that 'as far as perception is concerned the only things with which an observer has direct or immediate contact is his or her experiences' (p.24).[2] In the ordinary senses of terms this is just false: one can have direct contact, e.g. by touch, with a variety of physical objects (one does not, in this sense, have direct contact with one's experiences). There is no gap to fill, in veridical perception, between what is given in sense perception and what is observed, e.g. physical objects with ascribed features; and so there is no breach in security. Chalmers assumes that the following points are key ones for the account of observation that CS1 and CS2 presuppose, and accordingly mounts his initial attack against them:

(i) (a) 'a human observer has more or less direct access to some properties of the external world

(b) insofar as those properties are recorded by the brain in the act of seeing';

(ii) '... two normal observers viewing the same ... scene from the same place will "see" the same thing' (p.21).

But though (ia) is crucial for direct realism - which offers one account of observation which will support CS1 and CS2 - neither (ib) nor (ii) are required, nor correct. (ib) is not significant as it stands (properties cannot be significantly recorded in the brain); and (ii) imports a mistaken assumption as to the sort of relation seeing is, namely a sort of physical (Brentano) relation so that if one observer simply replaces another with the same physical equipment the results will be the same. But seeing is not such a relation. A trained bird watcher will look for and see much that a newcomer does not. The fact that trained or skilled observers may observe much that inexperienced or bored observers do not, provides no support for (ia) and in no way undercuts commonsense accounts of observation which support CS1 and CS2. Chalmers errs in thinking that it does (p.25).

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[1] Also (p.23) 'What an observer sees, that is, the visual experience that an observer has'. But what the observer sees may be a fly-catcher in a mist net, which is not a visual experience. The identification involves a category mistake.

[2] In fact, Chalmers thoroughly confuses seeing with contingently connected components of the physiological process; p.20 ff.

There is the question what we do say, and what we should say, in examples such as representations, x-ray pictures, microscope slides, etc., where faulty theories have forced some philosophers to say that although different observers perceive the same thing they interpret it differently. The novice sees a patterned bird, the ornithologist sees a Ground Thrush; yet in the transparent sense (strictly, determinant) of 'see' what is seen by both is the same.[1] Representational cases involve a further factor beyond transparency and opacity, that of representation of the object. The radiologist sees what the lines and blotches represent as well as the lines and blotches: the novice may not. The identity linkage is more complicated than in the nonrepresentational case where the patterned bird is (identically) a Ground Thrush: my chest is not lines and blotches. Rather, the pattern of lines and blotches is the representation of my chest.

There is also the question, when a skilled observer in some way avails himself of experience or equipment which has relied on theory, whether that makes his observation theory-dependent in some sense. But very many cases of observation involve no such use of theory; and in many that do what was once theory may have become fact. Of course if a questionable theory is applied, the results are doubtful to that extent. But that some sophisticated observation may be theory-dependent does nothing to cast doubt on CS1 and CS2. For these it is enough that a solid basis (and an increasing basis when further facts are verified) is available, that many observation statements are not damagingly theory-dependent.

The thesis that Chalmers really is presenting, that

DT1. All perception and perceptual experiences are (damagingly) theory-dependent (see 76, p.33),

would refute CS1 and CS2. But the thesis is supported only by a selection of contrived examples, when a representative sample will contain many counter-examples; i.e. the argument from selective examples involves a fallacious some to all argument. In any case DT1 is simply false: much direct perception of features of objects, e.g. by animals, depends on no theory.

For similar reasons there is naught but an invalid inductive argument from a series of specially selected examples - what one is mostly offered by exponents of the thesis, usually by philosophers who frown on inductive arguments for generalisations - for the main thesis now opposed to the commonsense theses CS1 and CS2, namely

DT2. All observations and observation statements are theory-dependent. (Observation statements are roughly - it is always roughly - statements reportive of observations, and commonly of elementary logically form, such as af.)

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[1] The two act theory of perceiving, in terms of pure experiencing plus interpreting, is also a product of the Reference Theory; for it is an attempt to account for opacity in perception (as indicated in such phrases as 'seeing as') in a referential fashion. The two act theory is criticised in more detail in 11.4: see also Kuhn 70, pp.194-5, who makes the point that interpreting implies deliberative action in choosing among criteria and rules, none of which interpreting in perceiving exhibits.

The argument from examples for DT2 does not however rely simply on randomly selected examples but relies either on (what is still inadequate) some surprising examples or on such examples, together with the suggestion that, in the same remarkable way, other statements, all other statements, thought to be purely observational are in fact theory-dependent. There are two decisive objections to this. Firstly, there are very many observation claims that appear in no way liable to prove theory-dependent. Secondly, some of the surprising examples offered do not, when context-dependence is properly taken into account, show what they are alleged to show. Examples of observation statements that are hard, and in no-way liable to theoretical degeneration, are not difficult to produce (many workaday statements of "primitive" peoples will serve): 'The log is heavy', 'The fire is hot', 'Elbert is asleep', 'It is raining', 'That wallaby has a joey', 'Oko has red hair', 'The grass is brown', 'The bees are not flying', 'The larder is bare', etc. All of these assertions depend on a contextual setting, to determine which object, which Elbert, what place, and so forth.[1] So also do assertions such as 'The wall fell down', a case of the type Feyerabend claims, surprising as it may seem, is theory-dependent, because it presupposes a primitive theory of space with absolute directions. Feyerabend's claim neglects the contextual setting, a location on the surface of the earth, and illegitimately extrapolates that assertion to all of space. That the assertion is, under classical logical analysis, again, surprisingly, about everything in the actual world, is an accidental feature: for 'Joe fell down', where 'Joe' properly names the wall or some other individual is not. The claim 'Joe fell down' presupposes no theory of the universe, no theory of gravitation or the like, and no theory. It makes use of the notions of falling and of down, and so, one may say, of direction within the neighbourhood contextually indicated; but the notions are pretheoretical and independent of any particular theories of what accounts for falling and why down is down. As even this is contentious it is worth sketching some of the support. Firstly, people, e.g. children, can learn the meaning of, and understand, such statements as 'Joe fell down' without imbibing whatever the going theories of gravitation and orientation in the community happen to be, if any. Secondly, different communities or tribes can often understand statements of this sort made by tribes with different myths and theories. The notions are not sensitive to change of theories, but rather theories must conform to these notions or have as well an account of why they do not. These points tell against the further thesis used to back up DT2, namely

DT3. 'Observation statements must be made in the language of some theory, however vague' (Chalmers 76, p.26).

All that is true in this is that observation statements must, when stated, be made in some language or equivalent coding. But a language is not a theory.[2] Feyerabend, Chalmers and others suggest however that it is. What we are being offered here is a low - an appallingly low - redefinition of 'theory', so that much that would not ordinarily be counted as theory at all comes to be accounted theory. Roughly, any notion that one could have a theory about, such as heaviness, falling, wind, etc., will be accounted - under the excessively generous redefinition that underlies the theses DT2 and DT3 - theoretical. But the fact that someone could, or does, have a theory about brownness or rain does not show at all that 'is brown' and 'is raining' must be theoretical predicates, or that 'The grass is brown', in the ordinary, as distinct from the redefinitional sense, must be in the language of some theory. To argue so would be to commit a modal fallacy. Only redefinition saves matters, by making such notions by definition "theoretical". Under such a redefinition, since any statement makes use of a predicate, and any predicate will be theoretical, DT3 is analytically true. Similarly under redefinitions such mistaken theses as the following are rendered true: no arguments are conclusive, no one can do anything on their own, no one is really free, there are no real physicians, nothing is certain, everyone is mad really; the last three examples are taken from Edwards 60 and Wisdom 52, where the philosophical strategy of low and high redefinitions, a trick especially favoured in sceptical arguments, is well explained and criticised. As in sceptical cases, the redefinition of theory which renders all ordinary and commonsense discourse theoretical, has little to recommend it (except perhaps to exponents of theses like DT1), and much against it, since it tries to rule out some valuable contrasts, e.g. between theoretical and observational, theoretical and factual, theoretical and experimental.

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[1] But context-dependence does not entail theory-ladenness.

[2] (Footnote on next page).

Low redefinition is only part of the method used in arguing for DT3. Another is to try to read into claims much more than may be intended, with a view to locating some theoretical elements. Consider the first and most detailed example Chalmers offers in support of DT3; it concerns the "simple" sentence (grammatically and logically it is not so simple)

> ... "Look out, the wind is blowing the baby's pram over the cliff edge!" Much low-level theory is presupposed here. It is implied that there is such a thing as wind, which has the property of being able to cause the motion of objects such as prams, which stand in its path. The sense of urgency conveyed by the "look out" indicates the expectation that, the pram, complete with baby, will fall over the cliff and perhaps be dashed on the rocks beneath and it is further assumed that this will be deleterious for the baby (76, p.26).

Much of this is pure embroidery not warranted by the imperative at all. Since the thesis DT3 the example is supposed to be supporting is about statements, not warnings or the like, let us extract the statemental component

(a) The wind is blowing the baby's pram over the cliff edge,

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[2] (Footnote from previous page).

Similarly statements presuppose classifications, e.g. of things as of this or that sort, as green or brown, as objects or processes, etc. But classifications are not theories. For example, while theories can be true or false, classifications cannot, etc. And while some classifications are theoretically-based, others are not, but are otherwise based, e.g. conventionally based. Furthermore, the addition of new classifications, e.g. of things in terms of changes in place, of things as static or stable, need not replace or overturn previous classifications, but can supplement them, and so help to enrich the background language. Thus no high-level metaphysical theory, e.g. as to the ultimate constituents of the world (whether substances, processes, or whatever), need be presupposed. Thus too, arguments from failure of invariance, in changing from one metaphysical framework to another, gain no grip.

and consider how much of what Chalmers says it implies and involves it does, and how much low-level theory is actually presupposed (Chalmers doesn't tell us which the theories in question are). Firstly, although (a) is about, among other things, the wind, it does not imply any generalisation about the wind of the sort Chalmers claims it does. In particular, (a) does not imply "There is such a thing as the wind which has the property of being able to cause the motion of objects such as prams, which stand in its path"; (a) makes no such generalisation about what the wind can do, but merely reports on what it is doing in a particular case. If the 'low-level theory' consisted in a low-level generalisation about the wind as a physical phenomenon, then (a) implies no such theory. What of the expectations (psychological theory?) alleged to be indicated? All are imported; none of those cited are warranted by statement (a). (a) concerns the baby's pram; it doesn't even indicate the baby is in the pram (so how, for example, is it assumed that the result will be deleterious for the baby?). Likewise nothing is said as to what is beneath the cliff edge; there may be no rocks but a soft grassy bottom. It is true of course that those who offer statements like (a) commonly have certain expectations, e.g. that the pram will fall. But where's the theory, even low-level theory, in that? Without redefinition and embroidery once again, there need be none. (The low level is zero-level.)

Another argument for DT2 (sketched in Chalmers 76, pp.25-6) resembles that for DT1, that nothing is secured by observation but private experience and a theory is presupposed in the building of such experience into public, testable observation statements. But according to direct realism (as explained in 8.10), observation claims are secured directly by observation, without a reductive circuit through logical constructions from private experiences. The argument depends, in short, on a special, and defective, theory of perception.

So also do arguments against CS1 and CS2 based on the fallibility of observation statements. The argument from fallibility, which presupposes DT2, is this:

DT4. 'Observation statements are as fallible as the theories they presuppose and therefore do not constitute a completely secure basis on which to build scientific laws and theories' (Chalmers 76, p.28).

The argument for the premiss fails with the failure of DT2. Veridical observation statements are contingently true, i.e. they may be false; but they are not fallible, i.e. liable to err, their security is not tellingly threatened. Chalmers appeals again to, what does not suffice, a range of special examples, and these examples do not stand up to examination. Consider the first, 'Here is a piece of chalk', uttered by a teacher indicating a white stick by a blackboard.

> Even this most basic of observation statements involves theory and is fallible. Some very low-level generalisation such as "White sticks found in classrooms near blackboards are pieces of chalk" is assumed (p.28).

Plainly no such assumption need be made, or would normally be made. Nor should such a generalisation (certainly false in classrooms that cater also for the blind) really be counted as theory. The remainder of Chalmers' case takes a familiar sceptical direction, e.g. the chalk may be fake,[1] with one difference:

> the more stringent the tests [designed to verify the statement] the more theory is called for, and further, absolute certainty is never attained (p.28).

The first claim is doubtful, e.g. tracing the origin of the chalk in some recognised limestone quarry would be as stringent as some chemical test, but involve little or no theory: the second claim is certainly false. Often in such cases, the real possibility of error is negligible: the claim made is not fallible and there can be complete certainty about it. Often where there is some ground for doubt the issue can be settled definitely with but a few checks or tests, i.e. the claims are not infinitely fallible. The fact that in some cases - as far as the chalk example is concerned, quite exceptional cases - there may be an appeal to tests which involve theory to resolve real doubts does not show fallibility in observational claims of the type; nor does it show that they presuppose theory. For such cases are not the sort of cases that would be used to test theories, and not part of the secure basis on which theories are based. What is required for commonsense theses such as CS1 and CS2 is not that all observation claims are reliable and not open to the real possibility of mistake, but that a roughly separable class (in fact a majority) of such claims are secure; and this is the case.

Not all observation claims are reliable; some are not veridical. It is not difficult to indicate areas where observations, even by honest observers, are to be treated with some caution, e.g. where new instruments are being used, such as telescopes in Kepler's time, or new phenomena investigated. Two of Chalmers' three less-contrived scientific examples illustrating DT4 are of this type. Kepler's claim, following observations through a Galilean telescope, "Mars is square and intensely coloured" is simply false (as Chalmers remarks), and so not a veridical observation statement. Thus it does not tell against CS1 or CS2 (similarly the boiling water on a high mountain example, p.29). In the electrostatic example, observational reports of small pieces of paper adhering to electrified rods are in order and not refuted by modern theories of attractive forces: it is only if experimenters are led on from this to a viscous fluid theory of electricity that error enters. Chalmers confuses observational and theoretical claims in setting up his illustration. The remaining scientific illustration does not concern an observation statement at all, but a generalisation based on the comparison of observations, namely "Venus, as viewed from earth, does not change size appreciably during the course of the year". So far from the example 'clearly illustrat[ing] the theory dependence and hence fallibility of observation statements' (p.29), it does not even apply to the thesis DT4 in question.

The arguments for the thesis of universal theory dependence accordingly fail. While it is true that many statements are theory dependent, many more than traditional empiricist accounts were prepared to allow, it is a serious logical error to conclude that all are theory-dependent. Given that there is a body of observational data which is not theory dependent (a system of factual constraints), the falsification of scientific theories, and the occurrence of anomalies, both serious problems for the newer idealistic philosophies of science, are readily explained, in a rather orthodox fashion

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[1] On the shortcomings of the sceptical arguments from fallibility see Wisdom 52 and Griffin 78a.

(namely, as by Popper 59, except that now, with the removal of sceptical arguments, some basic data is hard). It is a more straightforward matter, too, both accounting for theory change and succession - in a way that undermines recent accounts of theory succession - and obtaining a satisfactory account of theory choice. Theory choice is constrained by the observational data, more generally by a conformity to the facts requirement (as explained in Routley 79). So while much room for choice remains, because theories are intensional and cover infinitely many cases the factual data does not determine, theory choice is by no means totally free.

The direct upshot of the critique is, however, that the commonsense principles CS1-CS4 are not demolished by the new philosophy of science of the seventies: it is the new philosophy of science which, like the older faulty empiricism it aims to supersede, is at fault, not CS1-CS4. Subject to but minor qualification the commonsense principles can be retained, and of course elaborated. For example, the aims of science can be more fully stated, so that the central importance of such notions as approximation to the truth and probability are brought out, and the methods admitted can be more explicitly indicated, so that the range of admissible methods and of inadmissible methods can be appreciated. As regards what it takes the aims and methods of science to be the noneist account is, like commonsense, conservative - in contrast to the new philosophy of science where, for example, 'the claim that the aim of science is truth' is rejected on the (mistaken) ground that 'there are difficulties associated with the application of the commonsense idea of truth to science' (Chalmers 76, p.119 and p.121). As a matter of fact, however, Popper's account of the truth of a theory (stated by Chalmers 76, p.122), which is but a gloss on Tarski semantic theory, can be readily absorbed into the universal semantics already presented (cf. 1.24). Thus, a refined commonsense theory of truth can be applied to scientific statements and theories, as elsewhere: there is no difference in kind.

But though conservative in some respects, in its commonsense basics, noneism does offer a fresh and very different sort of account of, and outlook on, science from both older and newer philosophies of science, all of which involve referential assumptions. For according to noneism, science is decidedly other-worldly in attempting to account for features of this actual world; and, in its attempt to arrive at the truth and to explain things, phenomena and so forth, science considers, and for several reasons is forced into considering, objects that do not exist: indeed many of the objects of its best theories do not exist.

Accordingly the refined commonsense account of science aspired to has much in common with a neutral version of Hilbert's account of the extension of finitary mathematics to encompass transfinite and other ideal objects. In a similar way empiricist science is extended by nonentities, ideal objects idealisations and abstractions, alternative situations and uses, in order, in particular, to accomplish explanation. It is required in both cases that the extensions be conservative as far as the empirical facts go. Beyond that however extensions are not uniquely determined, and there is substantial room for theory choice, since many different theories can cover the same data.

§4. *Rejection of the new idealism and of modern conventionalism and relativism in the philosophy of science.* Throughout the book the argument has appealed to some of the hard pre-theoretical data of natural language, and what can be truly said in it, to argue against classical logic as (a framework for) a theory of truth and meaning which appropriately fits natural language and natural reasoning. It has appealed to simple theory-independent facts, such as that it is true that Meinong believed the round square is round. It has also appealed to the fact that, of the great multiplicity of inadequate accounts of intensionality classical logic has spawned to deal with the recalcitrant problems the truth of such statements raises, none can bring out such a true statement, or the great class of other statements it represents, as true in its original and natural sense. That no theory of intensionality which works within the constraints of the classical theory can provide an adequate account which does so, has also been argued in §8.1. But an inadequate analysis of such a class of problem statements and of intensionality generally is no trivial discrepancy, but has a significant bearing on the resolution of a great variety of philosophical problems. On these grounds there is an excellent case then for regarding classical logic as an inadequate theory, which should, on any objective criteria for theory assessment, be up for abandonment or replacement, and which remains unquestioned and dominant for reasons which have little to do with theoretical legitimacy and a great deal to do with entrenchment and theory-saving.

Recently however these accepted criteria for theory-assessment and the whole concept of theory-saving and of pretheoretical data have been called into question. It is claimed by a number of writers (e.g. Kuhn 70), that there is no such thing as pre-theoretical data, that all data is theory-dependent, that any "hard" fact can be rejected or reinterpreted to fit in with a theory - in short that "theory-saving" is inevitable and that there are no external criteria of data accountability by which theories may be compared, found to fall short, preferred or rejected. If this is so then the theory-saving approach of classical logic to the "data" of natural language would appear to be quite legitimate.

In Kuhn 70, we are presented with an account of scientific revolutions and of theory change which differs markedly from the conventional empiricist account. The account presented combines elements of conventionalism, relativism and idealism.

The conventionalism emerges in the account of the acceptability and correctness of theories in terms of the assent of the relevant scientific community (circularly defined), of complying with the rules of the game as accepted by this community, and the reduction of methodology essentially to such matters. 'As in political revolutions, so in paradigm choice - there is no standard higher than the assent of the relevant community' (p.94). There are no external or objective criteria then for theory-assessment, and the notion of correctness of a theory, in terms of correspondence to an objective, external reality is pronounced 'illusive' (p.206).

The position leads to many of the unintuitive consequences and faces many if not more of the difficulties of conventionalism in other areas, e.g. ethical conventionalism and relativism. It is certainly possible, for example, to envisage "scientific" communities which did not follow adequate methodological rules, indeed it seems that this may often well be true of the scientific status quo, and improper methodology appears to have been a feature of much past science (e.g. medieval botany and physiology).

Like all conventionalisms, it is convincing only so long as one is prepared to accept the conventionalist's arbitrary stopping points ('the rules'), and does not attempt to obtain an explanation of why the conventions are as they are. Thus the Kuhnian account cannot really explain scientific revolutions; it cannot explain *why* there is a *crisis* when theories are felt not to fit the facts, *why* the 'game' is no longer playable, or felt to be playable, according to the old rules, *why* there are felt to be disturbing anomalies, and why even entrenched theories are thus eventually abandoned, according to the promptings of methodological conscience, if they persistently fail in the relevant ways. Such 'crises' and 'shifts' have to be explained as apparently arbitrary gestalt changes, illuminating not the world, but only its human observers or interpreters and thus must simply be accepted without further explanation, as ultimate. There still does seem however, to be something further to be explained about such a crisis, an anomaly etc. The obvious explanation is that there is a crisis or a felt anomaly *because* the theory does not fit some set of (at least partially) independent facts, and that theories are eventually abandoned, despite pressure to retain them, for the same reason. But such an explanation goes outside the framework allowed by conventionalism, and the position thus appeals to data (crises, anomalies, paradigm, shifts, etc.) which cannot be satisfactorily explained within its framework.

The conventionalist position adopted leads to a number of difficult and anomalous consequences. However it does not seem to have been followed out in a consistent way in Kuhn's essay. The thesis that no data is theory-independent is inconsistent with some of the facts of pre-theoretical data collecting cited earlier in the work. Thus also it is claimed *both* that there is 'no standard higher than the assent of the relevant community', that the point of the exercise is only that of persuasion, that there are no external criteria imposed by the external world by which theories are found wanting, *and also* that 'observation and experience can and must drastically restrict the range of admissible scientific belief, else there would be no science' (p.4). But this is simply inconsistent, for it is asserted both that there are no constraints imposed by the external world, and that there *are* such constraints. But it is the former position which is the real consequence of the relativism and denial of external criteria, as well as of the view that all the data is theory-dependent. For if all data and problems are theory-dependent, if there are no external criteria for choosing between theories, if any degree of theory-saving and epicycling are logically and methodologically acceptable, then these devices can be employed everywhere to avoid accountability to the data, so that virtually any theory *can* be imposed on the data, and observation and experiment cannot provide external constraints in the way claimed.

This inconsistency appears to result from the desire to retain conventionalism and the resulting relativism without embracing the paradoxical and unintuitive consequences they entail. Many of these consequences have however been embraced by Feyerabend, for example, the consequence that science is no different from religion or witchcraft. This does indeed appear to be a consequence of such a conventionalist and relativistic approach. For if science has any claim to differ from these and from the construction of fiction, it must be in terms of its accountability to an external reality. The thesis of total theory-dependence of the data and of problems does however involve denying such accountability.

The point of empirical research and experiment appears to be lost entirely, presumably becoming no more than a sort of social convention or ritual. Prediction is equally a problem. Discussion, assessment and comparison between theories becomes impossible to account for, apparent discussion presumably becoming no more than a sort of sophisticated persuasion campaign ('buy my brand'). The position faces here the same sorts of problems about assessment and comparison which face extreme relativist accounts of ethical discourse ('x is good' means 'I like x'), where discussion as comparison and disagreement are equally impossible to account for. Theory construction becomes an activity difficult to distinguish from the creation of fiction, and is equally lacking in explanatory ties to an empirical reality which can provide grounds for its rejection as 'wrong'. But although theories and fictional works may occur on a continuum, with myths falling somewhere in the middle,[1] the distinguishing feature between theories and fictions does appear to rest on the fact that theories are falsifiable and rejectable in terms of the truth or falsity of statements concerning the actual world, whereas works of fiction are not (see chapter 7). The position in short, seems to be involved in many of the well-known difficulties of idealism and scepticism and similarly appears to be headed towards denying either the reality, or the knowability, of an independent, external world.

As this fact suggests, the conventionalist account of science is buttressed by an idealist account of perception, in which one never actually sees an item as it really is. Indeed not merely the knowability but the very existence of an independent, external reality seems to be denied by Kuhn, who wishes to say that the world itself changes when the theories which are intertwined with the perceptions of it change; thus 'the electrician looking at the Leyden jar saw something different from what he had seen before' (p.118), '... after a revolution scientists respond to a different world ...' (p.111), 'after Copernicus, astronomers lived in a different world ...'. Thus it is claimed that a change in our ideas of the world changes the world, not merely our perceptions, theories or interpretations of it, while subsequently (p.121) the existence of stable, theory-independent objects of perception is explicitly denied. It is argued that scientists holding different theories do not 'see' the same thing, because one sees oxygen and the other sees dephlogisticated air. But oxygen is not identical with dephlogisticated air, therefore they do not see the same thing and there are no stable, independent objects of perception.

These arguments and the idealist theory of perception advanced do not represent a new paradigm for perception, as Kuhn appears to believe, but rather an old muddle based on the old paradigm. The argument for the instability of data is closely related to the sceptical argument from incompleteness (discussed in 8.10), and like it is based on the confusion of transparent and opaque senses of 'see' and thus ultimately on the Reference Theory. For while it is true in the opaque sense of 'see' that each scientist sees something different (dephlogisticated air in one case and oxygen in the other), it is not true in a transparent sense. The opaque sense of 'see' is often indicated by the natural language locution 'seeing as' (which prohibits substitution of contingent identities), while the transparent sense is usually indicated by the use of the expression 'in fact' (which indicates the permissibility of such substitution). Thus it is true to say that *what Priestley saw as dephlogisticated air was in fact oxygen* (i.e. $\iota z(pPz) = o$). The distinction between the two senses (which is only possible once the Reference Theory is rejected, as explained in 8.10), can resolve the problem of admitting the incompleteness, fallibility, selectivity and "theory-dependent" character of perception (including its links with other perceptions and with belief systems) without denying the stability of the objects of perception. For the transparent sense of 'see' can provide a stable object of perception which has just the properties the independent object in the external world has, independently of what it is perceived as being, while the opaque sense can allow for the features of 'seeing as' which result from the intensionality of perception.

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[1] Many myths and legends have the feature which distinguishes them from fiction, that they do attempt to account directly for the origin of observable features of the actual world, e.g. 'the waterhole was made by a Dreamtime woman digging yams', 'the stars are the campfires of dead ancestors in the sky and the Milky Way is the smoke from these fires'. Thus in many ways they resemble theories more closely than fictions, but must be seen as having features of both (cf. 7.10).

Given such an account, which follows that indicated in natural language, there is no need to attempt to account for the problem in the common way which Kuhn rightly criticises, namely by splitting perception into *two acts*, "seeing" (still conceived of as referential) *plus* a further act, interpreting or organising what is seen. Such a two-act account ultimately derives from the Reference Theory, for it attempts to retain seeing as a referential relation between the perceiver and the perceived, and to add the intensional features of seeing on as a *separate* act ('interpreting', 'organising' etc.). As Kuhn rightly points out, it faces many difficulties and cannot account adequately for what goes on. The "two" acts apparently cannot be performed separately, and the "first act", the referentially-construed relation of perception, yields the legendary stuff of perception, raw sense data. The "second act", interpreting or organising, as Kuhn notes, implies a deliberate and conscious choice among alternative theories or interpretations, which is not what occurs when something is seen *as* something else. The distinction between opaque and transparent senses of 'see' and other perception functors enables an account of perception as a single, integrated act, but one which admits of a further important logical distinction turning on the account of identity.

This modern terminological variant of idealism, according to which all is theory-dependent and the World is Theory and Idea, is, like its predecessor, a reaction against the excesses and faults of empiricism and in particular, in the modern case, the empiricist account of theory assessment. For empiricism, true to its program of denying the intensional and attempting to account for everything in extensional terms, has given an *extensional* account of theories and of theory-assessment which attempts to make theories seem much more limited to, and merely descriptive of, the *actual* world than they really are. Thus it has ignored such features as the variability and infinite corrigibility of observational data, which derive from the way in which ordinary observation statements support counterfactuals and thereby go beyond the actual world. It has equally overlooked (or played down the extent of) the theory-dependence of much of the material a theory organises, for theory-dependency is an intensional feature: theories are intensional (as argued above), that is, their assessment stretches out over other worlds than the actual, and so then in general does what depends on them. Because in the empiricist account theories have been made, in the interests of extensionalism, to look much more closely tied to and determined by the actual world than they really are, they have also been made to look much *more* falsifiable and readily rejectable on the basis of simple observational data in the actual world than they really are.

In accordance with this extensionalist program, simple empiricism accounted for theories as inductive generalisations which simply summed up observations in the actual world. As the defects of this account become clearer, it was replaced by the Popperian account in terms of falsification (or variations upon it, such as the hypothetico-deductive account), which attempted to rehabilitate the extensionalist program of the actual world as the entire determinant of theories, of their assessment, point and construction. Given such an account in terms of falsification, the extensionalist program could (it seemed) be retained. Because falsification occurs entirely in the actual world, if the entire point of theory construction turns on falsification, theories are accountable for entirely in terms of the actual world. Other features of theory construction and assessment which require an intensional account, can then be written off as logically extraneous to the real business of theories, as simply social or psychological facts about how people happen to arrive at theories or hypotheses.

The Popperian account admits of ready caricature. The view that the point of arriving at theories is to falsify them is, of course, a very odd account of the process and purpose of theory construction, which has been compared to the view that the purpose of building a house is to demolish it. As many have pointed out, it distorts the actual practice and purpose of science, implying that theories must be abandoned immediately once falsified, and that the good scientist, the one who best fulfils the aim of science, is the one who cooks up the most falsifiable theories, whatever their other merits. The account ignores completely the positive functions of theories, especially the way in which they enable the interpretation and organisation of experiences in the actual world by setting them within a large framework of relationships which go well beyond the actual world. It focusses exclusively on the negative constraints on theories, or falsification, because the positive functions connect with the way a theory goes beyond the actual world. What is appealing and right in the falsification account is that falsification is important, that the actual world does provide a set of crucial truth-constraints on admissible theories.

In contrast to the empiricist account the idealist account correctly draws attention to the way in which theories go beyond the actual world, and the important ways in which they resemble fictions or myths, and are ways of interpreting, organising or modelling the actual world; that is, to intensional characteristics of theories. In the process however, it tends to deny accountability to the actual world. The idealist account in fact obtains much of its credibility from seesawing between two quite different positions, one of which denies accountability to the actual world, and the other of which merely opposes the empiricist account, for example often swinging ambiguously between the two positions that there is no hard data at all, and that the hard data alone does not determine the theory.[1] The former position leads to idealism and scepticism, while the latter simply denies the extensionalist and empiricist thesis.

Another dimension of difference between the empiricist account of theories and that of their new idealist opponents concerns the role of wholes and parts. The empiricist account gives a partist[2] account of theories, in which they are just the sum of their self-contained and separate parts which can be accepted or rejected separately from the whole. The new idealist opposition draws attention to the systemic (or holistic) features of theory-assessment denied in the empiricist account, and sees the "facts" as incapable of separate assessment or rejection apart from the whole theory of which they form part.

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[1] For example Kuhn, p.4 again, 'Observation and experience can and must drastically restrict the range of admissible scientific belief, else there would be no science. But they cannot alone determine a particular body of such belief'.

[2] A not unfamiliar term explained in ENP: atomistic individualism is a rough equivalent for partism.

To see the basis of the dispute in the faulty empiricist account of theory assessment (and its partist view of the universe) is to see that the choice between this empiricist account and that of the new idealist position presents us with a false choice. For in order to allow for the fact that theory assessment goes beyond the actual world, there is no need to deny that theories are also assessed in terms of their fidelity to the actual world, which has thus a special place, both in falsification, prediction and experiment and in providing truth constraints on other criteria for theory choice. Because theories do go beyond the actual world and the hard data determined in it, the hard data alone can never completely determine a theory, but only act as a constraint upon it. Similarly in order to recognise the systemic or holistic aspects of theory-assessment, it is not necessary to see individual statements as entirely inseparable from the whole theory, for reduction of wholes to their parts versus reduction of parts to wholes are not exhaustive alternatives.[1] To recognise that much "data" is theory-dependent and thus reinterpretable in the light of the theory, it is not necessary or correct to see all data as of this kind and to deny the availability of hard data and thus of any external independent checks on theories.

The point is perhaps best illustrated by considering historical theories and historical explanation. History is (as observed in chapters 2 and 10) intensional, and much data is highly theory-dependent. The selection, significance and importance of particular events and historical tendenices is highly relative to social and political outlook, and the general theory of mankind and of society adopted. Much data can be interpreted in the light of this kind of theory. Nevertheless it is both possible and necessary to draw a distinction between theory-dependent and non theory-dependent historical data, and to distingusih a class of "hard" data. The fundamental social reasons for and the significance of the settlement of Australia, or the First World War or the Great Depression, might be highly relative to the social, political and economic theory adopted, but not the fact that they occurred. There might be historical debate and much room for different interpretations concerning the effect and the significance of 19th Century Russian nihilist terrorism and its role in producing the subsequent revolutions in Russia, but not about the fact that the nihilist movement existed, that it did succeed in assassinating the Tsar, and so on. These are facts of hard data, independent non theory-dependent facts in the external world to which historical theories and explanation must be held. Historical theories might be entitled to reinterpret the significance of much of this hard data and thus to adopt varying approaches to higher level generalisations concerning social tendencies, but they are not entitled thereby to reject or falsify the basic hard data to suit their theories; to do so is methodologically illegitimate, and illegitimate in other ways too. The new idealism implies however that there is no real difference between such reinterpration and falsification, that expunging Napoleon's name from the history books and denying that he ever existed is a 'reinterpretation' no different in kind from reinterpreting some generalisations concerning the significance of his conquests.[2]

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[1] As argued in the case of social theories in ENP.

[2] (Footnote on next page).

The same considerations show that the position that there is no hard data leads directly to scepticism, to the thesis that there is no knowable, independent external world. For if the scope of history includes all "facts", and all "facts" are theory-dependent, then nothing can be known for certain.

The main direct arguments the new idealism presents for its position, those for the theory-dependence of the data, have already been examined and rejected in the previous section. An important further set of arguments involves appeal to certain features of alleged scientific practice, which, it is claimed, support the position. Thus, it is claimed (e.g. Lakatos 67, Martin 79), examination of present scientific practice shows that theories are not abandoned when "falsifying" evidence is produced, and theories consistently take precedence over the data, which is reinterpreted to fit in with the theory. Theory saving, in short, is consistently practised.

The argument depends in part upon a low redefinition of 'theory-saving'. Theory-saving does not occur merely when such a theory is not immediately abandoned because of some single piece of empirical evidence, but only when a body of evidence is systematically produceable. Nor is this sufficient. It is not surprising that theories are not abandoned immediately even in these circumstances, for normally an attempt would be made to extend the theory to see if it cannot take account of the problem area; and it might in any case, as many have pointed out, be retained as a working model, despite awareness of deficiencies and the need for repairs or replacement, simply because no alternative is available. Theory-saving does occur in a clear (and clearly reprehensible) way when a theory is retained even after repeated attempts have been made to account for the problem areas and have failed to do so satisfactorily, (i.e. without creating further serious problems) and when an alternative theory is available which can account for the problem areas in a straightforward way without difficulty, and which, furthermore, can explain why the other theory fails to do so adequately.

It may be objected that whether the extension is satisfactory is always relative to the theory, because problems are always defined by the theory. But if classical logic for example must assign the value false to a whole class of clearly (and pre-theoretically) true statements such as 'Meinong believed the round square is round', or reinterpret them in such a way as to make them false (e.g. as 'Meinong believed that there existed a round square and that it was round') when they are clearly in appropriate circumstances true, then it is not merely a theory-relative matter that such a theory cannot account satisfactorily for problem areas, any more than it would be if a certain theory of colonial history denied the reality of the settlement of Australia.

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[2] (Footnote from previous page)

The existence of Napoleon may of course be doubted and disputed. It can be maintained that history books present us with a giant conspiracy to maintain the fiction of Napoleonic existence. The settlement of Australia can also be disputed, although this would require a more determined sceptical stand. But at this point the close affinity of the position with scepticism, the fact that it rests finally upon the same unreasonable demand for incorrigible, infallible "knowledge" (in this case before the label 'hard data' can be applied), becomes clear.

Both the character of the data and that their attempted resolution or reinterpretation of it is unsatisfactory may of course be disputed by adherents of the faulty theory; however to argue that such data therefore isn't "hard" or isn't objectively or independently establishable unless it is beyond dispute is again to impose a requirement on "hardness" which is far too strong, and which has close affinities with the sceptical requirement for knowledge, that nothing is known unless it is absolutely beyond dispute and cannot possibly be wrong. Of course there is no such "knowledge". As the libertarian principle defended in chapter 6 asserts, anything may be disputed or believed. The mere fact of disputability does not show that there is no hard or pre-theoretical data, no externally assessable criteria of accountability for data to which theories must measure up, any more than the sceptical analogue of the disputability argument demonstrates that nothing can be known.

That genuine theory-saving of the kind indicated sometimes does occur in existing scientific practice is clear. The question is whether it should occur. The new idealist procedure of attempting to legitimise existing theory-saving by appealing to the actual practice of contemporary science is a dubious one, which simply fails to take account of the rather obvious possibility that much in prevailing scientific practice is not what it ought, on the grounds of methodological legitimacy, to be.

There is no lack of sociological explanation for this state of affairs. As everyone knows, science has an important place in the economies of most developed nations, where a considerable slice of GDP is allotted to it. The credentials required for scientific contributions have become much more rigorous, there are more scientists alive today than in the whole preceding history of mankind, and so on. Science is well and truly established. These factors seem to have been enough to persuade some, who see scientific achievement as merchandise to be purchased, that present science, which is after all, so expensively bought, must therefore be good science. But precisely these factors (or ones closely connected with them) help to ensure that in many respects it is not good science, and that its practice is corrupted by the fashion of its success and establishment and is not therefore a model for methodological legitimacy.

The attempt to retain, in the face of contrary evidence, a theory or thesis with which one is closely identified and in which one has heavy investments is a natural, widespread and human reaction. However this reaction is successful only in particular social circumstances in entrenching theories which should be abandoned. A striking feature of the establishment and growth of science and intellectual inquiry generally in the last 50 years has been professionalisation and the corresponding monopolisation of intellectual life by institutions. As everyone knows, these institutions are now almost invariably organised along more or less centralised, bureaucratic and hierarchical lines, with control over rewards and progress in particular areas being exercised mainly by a hierarchy of senior professionals with heavy investments (e.g. a life-time's work) in particular areas and theories. Senior professionals with heavy investments in certain established theories thus control to a high degree what is taught, how the evidence is presented (through textbooks), what is published (in professional journals), at all levels who is employed and promoted, and which lines of research and investigation are pursued. Very often the more "mainstream" and prestigious the institution, the greater the exercise of such controlling and selecting factors, so that the climate and opportunity for the exploration of new theories may be available only in a few out-of-the-way places (something which is well illustrated in the case of non-classical logics). The greater rigour of qualification requirements can easily, in such circumstances, be used to ensure entrenchment of defective theories. In such a situation it would hardly be surprising if "non-respectable" positions did not usually prosper, and if theory-saving became not only common but normal practice: and in fact the professionalisation, institutionalisation (in some places officialisation) and corresponding hierarchical control of intellectual life has coincided with a decrease in the rate of major theory overturn, compared with the period which preceded these developments. Even where theories are eventually replaced by new ones with better ability to account for the evidence (as in the case of the theory of continental drift for example) a substantial lag may be required while an old hierarchy dies off and is replaced by a new one with smaller investments in the older, unsatisfactory theory. The admittedly widespread practice of entrenchment and theory-saving can thus be readily explained as a social rather than a methodological phenomenon. The fact that the social situation outlined (which is by no means either inevitable or beneficial as a means of organising a society's intellectual life) encourages entrenchment and theory-saving does not however make the practice of it either methodologically legitimate or necessary.

The attempt to establish what methodological practices are legitimate by appeal to the social practice in such a social situation may be compared to the attempt to establish what bureaucratic procedures are legitimate by examining and appealing to actual bureaucratic practice. Anyone investigating actual bureaucratic practice will no doubt find the very widespread practice of what might be called policy-saving. Policy-saving occurs when bureaucrats promote certain policies they favour over others they do not and when they manipulate secrecy and their control of information to discredit policies they do not favour and promote others, even where these others are contrary to the desires, interests and preferences of electors. Any examination of bureaucratic practice would discover no doubt that bureaucrats have a large amount of power and a major role in determining policies, although they are not elected and the exercise of such power is contrary to the theory of democratic control. A procedure analagous to that followed for scientific method will conclude that policy-saving is legitimate, that the role of bureaucrats in exercising power must be recognised, and that the democratic aim and ideal of fully accountable power controlled from below is unsatisfactory and should be abandoned, as not corresponding to any real or viable bureaucratic practice. Attempts to treat the autonomous exercise of bureaucratic power as an abuse which departs from the ideal of what is legitimate, attempts to make practice conform to some ideal model of external democratic control and responsibility, are unrealistic. Prevailing practice should be accepted and legitimated. The best we can ever hope for is benign and slightly controllable rulers as opposed to malign and uncontrollable ones.

In the same way the appeal to scientific practice implicitly writes in the legitimation of the status quo in scientific methodology, and decries the attempt to make practice conform to a difficult ideal. The ideal of methodological soundness in theory assessment, like the ideal of genuine and full democracy or equality of power, may be difficult to attain and there may always be forces which work against it, but the ideal can be more or less nearly approximated to, and some practices and forms of organisation are much better able to express it than others. But the failure of prevailing practices to attain it is not a reason for abandoning the attempt and retreating to some form of methodological cynicism and scepticism and utter relativism. The legitimation of such abuses by appeal to realism and current practice is superficially radical but in fact lends assistance to an extreme entrenchment of the theoretical status quo. As Kuhn himself notes (on pp.79-80), new theories always in fact progress by appealing to the methodological conscience, by treating as counterinstances what the theories they replace attempted to treat unsuccessfully as further problems within the theory. It is only by appeal to such a methodological conscience and the ideals of checkability and conformity to an independent, external reality, and superior explanatory power, that new theories are able to make the small amount of headway they do in the face of the heavily entrenched conservative forces which oppose them, and the ability of the powerful to shape, determine and manipulate our entire view and experience of the world is checked and challenged.

CHAPTER 12

HOW THE THEORY ELABORATED DIFFERS FROM OTHER THEORIES OF OBJECTS IN ITS THESES AND OBJECTIVES

Theories of objects are rare in the history of philosophy. The main streams of Western philosophy from its inception to modern times and most of the lesser and minor tributaries are, with but few exceptions (already noted), referential in nature. Most leading positions incorporate central facets of the Reference Theory, in particular the Ontological Assumption. That Assumption appeared early in western philosophy - a strong form is at the bottom of Parmenides' philosophy - and is to be found in fairly explicit form in the work of both Plato and Aristotle. It lies behind the theory of ideas which, in one form or another, as Reid indicated, dominated philosophy (Greek, scholastic, and "modern") for two thousand years, and which has persisted since Reid's time, more recently in the shape of sense data theories.

The Reference Theory is an integral part of British empiricism (for example, it appears in explicit form in Russell and in Ayer, and versions of the Ontological Assumption may be found in Mill, in Hume, and earlier[1]), and has been thoroughly absorbed in recent Anglo-American empiricism, whether in positivist or pragmatist or ordinary language forms. Moreover referential assumptions go largely unquestioned in what are usually taken to be main alternatives to empiricism: they are taken for granted not only in the traditional rationalists such as Leibnitz (who approvingly formulated leading theses of the Reference Theory) and Spinoza, and in more recent realists such as Frege and Church, but also in Bradley and English hegelians, in Brentano, in Husserl and phenomenology, and in existentialism. Kant and German idealism provide no real exception, though idealists do complicate the (somewhat oversimplified) picture. For it was usually assumed, as by Kant, that any object that did not exist was given through a concept which did exist, and that ascription of features to such an object (as an object of possible experience) amounted to a judgement about the concept. In short, the Ontological Assumption was maintained by - what tends to disguise its presence - a conceptual (or idealistic) reduction. The general situation is like that in Descartes and Hume: the bound of conceptualisation is the possible, not what exists, but the (nonexistent) objects conceived are construed as conceived objects, as, in one way or another, mental constructs.

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[1] See, e.g. Mill 47, p.30 (i.e. Bk.1, ch.3, sec.2) and Hume 1880. pp.66-70. According to Hume,

> To reflect on any thing simply, and to reflect on it as existent, are nothing different from each other. That idea, when conjoined with the idea of any object, makes no addition to it. Whatever we conceive, we conceive to be existent. Any idea we please to form is the idea of a being; and the idea of a being is any idea we please to form.

Hume's claims may be refuted, in much the way the OA was refuted, by examples of objects and ideas to which no existence of idea of existence attaches. To refute Hume's claim it is not necessary to do what Hume tries to make out (p.67), which involves buying into his theory of ideas.

As in Russell, so in Hume and Locke the Ontological Assumption is not quite so restrictive as may at first be supposed. Much as Russell employed the theory of descriptions and, more generally, logical constructions to extend vastly what could be encompassed, so Locke and Hume used that forerunner of logical construction theory, the theory of complex ideas. (Locke's theory is discussed in 12.4). Thus Hume can imagine 'such a city as the New Jerusalem, where pavement is gold and walls are rubies' (1880, p.3), because this involves only a relation to a complex idea which exists.

To be sure, there have been deviations from strict referential standards, even among those counted as empiricists such as Mill (who was too honest to adhere entirely to tenets of hardline empiricism and who approached - what really only softens the Ontological Assumption - free logic) and Locke. Much more sweeping and important departures from mistaken referential standards are those of Reid and of Meinong.[1] Only Meinong could seriously be said to have a theory of objects,[2] though the rudiments of an analogous theory - enough for a theory in the familiar perhaps overgenerous philosophical sense - may be found in Reid's work. Furthermore Reid and Meinong appear to be alone (among historical philosophers) in clearly extending the domain of objects beyond the possible, beyond the rationalist bounds on intelligibility, to encompass impossible objects; only Meinong, however, went on to contemplate the inclusion of paradoxical objects.[3]

The last decade has seen a remarkable philosophical revival of interest in Meinong's theory of objects, due firstly to reassessment of the outcome of the Meinong-Russell debate (which previous decades of philosophers had assumed Russell won by a knockout) and wider realisation of the viability of something like a commonsensical theory of objects, and secondly to various attempts to advance the theory of objects, to set it in a modern logical framework and to fill out the semantical theory of (possible) worlds. Connected with this revival there has been a sporadic flowering of free and neutral logics and modalisations thereof and of relevant and paraconsistent logics - which revealed how many things, previously said to be impossible or incoherent, could sensibly, and sometimes truly, be said and done - for example, properties ascribed to nonentities, a logic of nonexistence worked out, highly intensional functors semantically assessed, and impossible objects and situations rationally confronted. Largely disconnected with this small[4] but remarkable revival, but eminently linked with it and important to join to it, there has been a wider swing (mostly outside recognized philosophical circles) against reductionism, and against such positions as thoroughgoing mechanisms and physicalisms.[5]

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[1] Less sweeping departures are encountered in some of the work of Moore and Chisholm, both of whom usually restrict quantification to existentially - loaded cases.

[2] Reid would have demurred at the assignment of such a theory to himself. Nonetheless main theses of the theory of objects are an integral part of Reid's criticism and rejection of the theory of ideas, as will be seen in §1. These theses are not what Reid's organisation of his work may suggest, and what some commentators have thought, merely tacked on additions to his work that are easily removed.

[3] To be fair, Reid was not so historically placed that the issue of paradoxical objects had come to matter.

[4] Rumour has it that the revival is to burgeon, particularly in U.S.A., with many new books and articles planned on possible and impossible objects, especially on those remarkably useful objects, worlds.

[5] The rejection of reductionism comes from many different quarters, by no means only from holists and marxists (who reject individualist reductions, but adhere their own sorts of reductions of individuals to wholes), but from a range of alternative, and often younger, thinkers outside academic philosophy, especially

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One of the objectives in this final chapter is to endeavour to draw together further historical strands and the recent developments mentioned, to unify them, but within limits, so, at the same time, to separate the theory reached from other theories, and thereby to continue (hopefully) the process of clarification of the theory. And one of the things that will emerge from all this is a programme, which includes a research programme for working out and assessing the combined effects of the theory of objects, ultralogic, and nonreductionism, i.e. of radical noneism in the fuller sense.

The procedure will be, accordingly, to investigate to some limited extent, what the theory has in common with and how it differs from, firstly, the positions of Reid and Meinong, secondly, recent theories of objects, primarily those of Casteñeda and Parsons, and thirdly, modern antireductionism.

§1. *Reid, commonsense, and the theory of objects.* Reductionism, in the empiricism of the seventeenth and eighteenth centuries, took the form of reduction to ideas (of one sort of another, e.g. impressions, ideas of reflection, etc.). The reductions of philosophers were thus primarily epistemological,[1] the primary problem being seen as that of accounting for human knowledge in its various forms and for the intellectual powers of man.[2] These reductions all, according to Reid,

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those who have been influenced by environmental and ecological matters, and from biologists (especially ecologists) and social scientists. As to the last, see for example, to get the feel of the swing (I make no judgements as to the quality of the case so far presented), Beyond Reductionism: New Perspectives in the Life Sciences (edited A. Koestler and J.R. Smythies), Hutchinson, London 1969; and also E.P. Odum 'The emergence of ecology as a new integrative discipline', Science, 195 (4284) (1977) pp.1289-93.

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[1] The modern art has been to replace epistomological reductions by logical reductions of one kind or another, e.g. to take an important class of examples, those in terms of complexes or associations of ideas by logical or set-theoretical constructions in terms of properties (or concepts) or sets.

[2] The main discussions in Reid's work of importance for the history of the theory of objects occur in his Essays on the Intellectual Powers of Man, especially the essays Of Abstraction and Of Conception and the section entitled 'Reflections on the Common Theory of Ideas' in the second essay.

To appreciate the value of some of Reid's work, the gems to be found with only a little fossicking, is not of course to applaud all of it. Some of Reid's work can be vaguely irritating, e.g. the human chauvinism, the attitude to "savages", and to the brutes (which included and was based on serious errors of fact, e.g. the sixth conclusion p.405), the protestantism, the celebration of the principles, assumptions, and values of the Enlightenment. In much of this Reid was only a creature of his enlightenment times. But the swing from protestantism to humanism, then occurring, only seemed to make matters worse, as evidence by Reid's contemporary Hume. For so much then devolves on man. It is not just philosophy that is human centred (e.g. 'the sole end of the logic is to explain the principles and operations of our reasoning faculty, and the nature of our ideas, Hume 1880, p.xix) with chauvinistic accounts of fundamental notions such as causation and probability, but that all science is really nothing but the science of man ('in pretending therefore to explain the principles of human nature, we in effect propose a complete system of the sciences...' p.xx) - a staggering thesis, and one quite invalidly reached (see p.xix).

> leave common sense at one and the same point and are on the road to Hume [and scepticism]. Whether they speak of eidola with Democritus, or of 'sensible and intelligible species' with the Schoolmen, or, since Descartes and Locke, of 'ideas', they all ... accept the 'ideal hypothesis' in one form or another. They all hold the theory which is summed up in the proposition that the immediate object of every sort of 'external' cognition [what is really perceived, conceived, remembered, etc. and acted upon] is a representative [existing, transparent] substitute for what one would ordinarily say that we say or touched, that we remembered, or in any way thought of (Grave 60, p.11),

Or, more briefly, the mind's immediate objects upon which it operates are always ideas which exist. Ideas are in fact fully referential intermediaries in all mental operations.

The theory of ideas in the larger sense - what, appropriating use of Reid's terms for the theory of ideas, we shall call the system of ideas - consists of two theses, first, the ideal hypothesis (or theory of ideas in the narrow sense) just stated, and, second, the principle of conceptual empiricism[1] (or conceptual limitation), according to which

> all our ideas (concepts) are, or are complications of, ideas of sensation or of reflection ... [i.e.] introspective experience (Grave 60, p.16),

that is, less explicitly, we have no ideas which we do not have from experience. Reid's most important theoretical contribution to philosophy was to isolate the system of ideas, to uncover its underlying sources, to follow out its consequences and point out the flagrant violations of common sense it leads to, to call it into question and to refute it.[2] His conclusion was that ideas (or images) do not exist, that is, ideas in the philosophers' sense, as contrasted with the vulgar sense (see 1895, p.291); and that, furthermore - until much is done (the four points Reid sets out on p.374), which Reid thought could not be done -

> the theory of images existing in the mind or brain ought to be placed in the same category with the sensible species, materia prima of Aristotle, and the vortices of Des Cartes (p.374).

The ideal hypothesis derives, as do essential characteristics of the ideas involved, from the Reference Theory, with but few further assumptions. Reid traced the main connections:

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[1] This principle, already examined in chapter 9, is further considered in connection with Locke's theory of complex ideas in §4 below.

[2] Cf. Reid himself (1895, p.88):

> The merit of what you are pleased to call my philosophy lies I think, chiefly in having called into question the common theory of ideas, or images in the mind, being the only objects of thought; a theory founded on natural prejudices, and so universally received as to be woven into the structure of the language. ... there is hardly anything that can be called mine in the philosophy of mind, which does not follow with ease from the detection of this prejudice.

> There are two prejudices which seem to me to have given rise to the theory of ideas in all the various forms in which it has appeared in the course of the above two thousand years...
>
> The *first* is - That in all the operations of understanding, there must be some immediate intercourse between the mind and its object, so that the one may act upon the other. The *second*, that in all the operations of the understanding, there must be an object of thought, which really exists while we think of it; or, as some philosophers have expressed it, that which is not cannot be intelligible (1895, p.395).

The second, and really important, principle, *the principle that ideal substitutes have to be found for nonexistent objects* of thought, *amounts to but a case of the Ontological Assumption*. The argument is as follows:- Operations, by definition, apply to objects, since they always operate on something to yield something[1]; and accordingly they ascribe features to the objects operated on, since, for every operation ϕ, a representing function R_ϕ can be defined, e.g. thus: $R_\phi =_{Df} \lambda xy(\phi(x) = y)$ (cf. Mendelson 64, p.120). By the Ontological Assumption then any object a of an operation, ϕ say, must exist (now); for if ϕ applies to a to yield something, b say, then a has the property $\lambda x R_\phi(x,b)$. The Reference Theory therefore implies that the objects of all operations, including mental operations, exist. But because a special case may be true where the general principle is false, it requires further argument than that against the Ontological Assumption to show that the special case is false. However arguments like those against the Ontological Assumption can be applied: they include, what Reid appeals to (e.g. p.373, also p.368), examples of intellectual operations which involve no existing objects, e.g. where one thinks of or dreams about or fears what does not exist. Moreover, it follows from the Independence Thesis that some operations apply to objects that do not exist: for some such objects have properties, thereby yielding characteristic functions, and so operations on them. There is good reason to think that, if any operations apply to nonexistent objects, at least those associated with intensional, and typically with intentional, properties do (so Reid's examples are no exceptions, but perhaps paradigmatic of cases when the OA fails). Hence there is good reason to think that the principle that every mental operation has an existing object is false.

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[1] Reid is not denying that mental operations have objects, only that the objects are ideas and that the objects must exist. On Reid's view 'every such act must have an object' (p.368); similarly (p.292):

> In perception, in remembrance, and in conception, or imagination, I distinguish three things - the mind that operates, the operation of the mind, and the object of that operation. ... There must be an object, real or imaginary, distinct from the operation of the mind about it.

Hamilton, a strong exponent of the OA, foolishly asks in his note on this passage:

> If there be an *imaginary object* ... where does it exist?

The short answer is: it does not exist. The object is the obvious object, e.g. the object of one's conception of a centaur is the centaur, which does not exist, and accordingly requires no location, no placement either within or outside the mind.

Reid disposes very neatly of the objection that, because we may say that a man who conceives a centaur has thereby a distinct image of it in his mind, we can

> infer... that there really is [i.e. exists] an image in the mind, distinct from the operation of conceiving the object [. This] is to be misled by an analogical expression; as if from the phrases of deliberating and balancing things in the mind, we should infer that there really is a balance existing in the mind for weighing motives and arguments ... if we only attend carefully to what we are conscious of in this operation [conception], we shall find no more reason to think that images really do exist in our minds, than that balances and other mechanical engines do (pp.373-4).[1]

An important anti-Cartesian thesis that Reid advances is that men think without ideas, and, more generally, that mental operations occur without internal mental entities such as ideas, impressions, images, species, sense data, concepts, etc. in the senses of philosophers. Reid explains how the appearance of paradox, arises in his opinion, from an ambiguity in the word 'idea' between the ordinary and the philosophers' sense:

> If the idea of a thing means only the thought of it, or the operation of the mind in thinking about it, which is the most common meaning of the word, to think without ideas, is to think without thought, which is undoubtedly a contradiction (p.373).

Reid's anti-Cartesian thesis is not as radical, then, as it may at first have seemed. For earlier on (p.298) Reid concedes that all ordinary acts and operations of the mind exist:

> No man of sound mind ever doubted of the real existence of the operations of mind, of which he is conscious!

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[1] Reid continues (p.374):

> We know of nothing that is in the mind but by consciousness, and we are conscious of nothing but various modes of thinking, such as understanding, willing, affection, passion, doing, suffering. ... But [as for] images in the mind, if they are not thought, but only objects of thought, I can see no reason to think that there are [i.e. exist] such things in nature-

an admirable precis (with a little allowance for other modes and other ways of knowing of the modes) of an important part of what appears correct in Ryle's Concept of Mind.

12.1 THE MISTAKE PRINCIPLE OF COGNITIVE CONTACT

The first principle underlying the theory of ideas Grave (60, p.25) calls the *principle of cognitive contact*, since it is a sort of epistemological no-action-at-a distance principle.[1] The first principle is, like the second, false, as Reid says (p.369; his further case against the principle is given on p.302 ff):

> There appears no shadow of reason why the mind must have an object immediately present to it in its intellectual operations, any more than in its affections and passions. ... persons, and not ideas, are the immediate objects of ... affections, ... somtimes persons who have now no existence ...

There was however an important traditional argument for contiguity of the object to the percipient which Reid had previously considered and rejected (pp.300-2), namely the following:- The mind cannot have intercourse with any object not present to it, e.g. it 'cannot perceive what it is not present to, because *nothing can act, or be acted upon, where it is not*' (Clarke, quoted in Reid, p.301, my italics). In the sense of 'act' ('physically act') in which the (italicised) principle of the argument is correct for entities, perception does not involve action, as Reid explains:-

> To make the reasoning conclusive, it is further necessary, that, when we perceive objects either they act upon us, or we act upon them. This does not appear self-evident, nor have I ever met with any proof of it. I shall briefly offer the reasons why I think it ought not to be admitted.
>
> When we say that one being acts upon another, we mean that some power or force is exerted by the agent which produces, or has a tendency to produce, a change in the thing acted upon ....
>
> An object in being perceived does not act at all. I perceive the walls of the room where I sit; but they are perfectly inactive, and therefore act not upon the mind. ...
>
> I see as little reason ... to believe that in perception the mind acts upon the object. To perceive an object is one thing, to act upon it another; nor is the last at all included in the first (p.301).

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[1] According to Reid (p.369, my italics), this principle

> depends upon [the second]; for although the last [i.e. the second] may be true even if the first was false, *yet if the last be not true neither can the first*. If we can conceive objects which have no existence, it follows that there may be objects of thought which neither act upon the mind nor are acted upon by it; because that which does not exist can neither act nor be acted upon

- by what exists, such as, on Reid's (not entirely coherent) view, the mind. But the argument breaks down if the mind does not exist (as Reid's treatment of mental images tends to suggest) and given that some nonentities can act upon others, e.g. Chloris bore a daughter and twelve sons to Neleus - all of whom, except Nestor, were killed by Heracles. But the latter Reid may have disputed, given the truth-value gap suggested in passing as regards 'creatures of imagination' (p.363).

One relation, that of acting-upon, is a physical, Brentano-relation, the perception relation is not, but is intensional. (By virtue of its intensionality, the relation of perception does not exclude, but may be coupled with, a physiological story concerning perception). Moreover, as Grave points out (pp.27-8) following Reid (e.g. p.372),[1] the introduction of intermediaries scarcely diminishes the difficulty of explaining the relation of mental operations to their prima facie objects.

Reid's main thesis is that

> (1) these two principles carry us into the whole philosophical theory of ideas, and (2) furnish every argument that was ever used for their existence. (3) If they are true, that system must be admitted with all its consequences. (4) If they are only prejudices, (5) grounded upon analogical reasoning, the whole system must fall to the ground with them (p.369, my numerals).

Observe that (3) strengthens (1), and (4) adds to (2). It is not just that the two principles incline, or induce us, to accept the theory of ideas, but that

(α) The two principles, together perhaps with other true statements which we cannot but admit, entail the theory of ideas;

and hence entail its consequences. Nor is it just that the two principles have figured in all the arguments that were actually used for the existence of ideas, but further it may seem from (4), there are no other arguments in which the principles do not occur essentially. The latter claim is difficult to establish, nor does (4) really require it. It suffices for (4) (as distinct from (5)) to show that

(β) The theory of ideas entails the two principles.

For then, by Modus Tollens, the theory falls with the two principles, or, for that matter, either principle. But it has already been argued (above and by Reid) that the two principles are false. (And (β) is true; for the ideal hypothesis implies both that ideas are immediately present to the mind and are acted upon and that they exist. Hence the theory of ideas is a mere prejudice. But none of the other marked assertions are correct without some qualification.

The analogical reasoning, remarked under (5), which Reid thinks accounts for the two principles is 'a supposed analogy between matter and mind', 'that the operations of the mind must be like those of the body'; more specifically, 'a strong and obvious analogy' between 'the mind and its conceptions and 'a man and his [material] work' (cf. again Ryle's Concept of Mind). No doubt the material analogy is important in accounting for the origin of the first principle, and has played a significant part in the widespread acceptance of the second, especially insofar as the assimilation of mind to matter has meant the assimilation of the intentional to the extensional. However the important reason for the adoption of the second principle, and the ideal hypothesis, is the Reference Theory.[1]

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[1] And as Reid has elaborated in the case of ideas (p.305),

> ideas do not make any of the operations of the mind to be better understood, although it was probably with that view that they have been first invented.

Without the enlargement of the second principle to (something approaching) the full Reference Theory Reid's claim (2) is in doubt. For several of the reductionist and sceptical arguments that were used by Reid's opponents (e.g. Descartes and Berkeley) for instance, arguments from perceptual relativity and from incompleteness, relied upon identity features of reference, while arguments from mistaken perception and false memories depended upon a more comprehensive version of the Ontological Assumption than Reid's second principle (which is restricted to operations of the understanding) covered. Indeed the argument to which Reid devotes most attention in the section (pp.300-5) where he claims to have 'considered [and found wanting] every argument I have found advanced to prove the existence of ideas, or images, of external things, in the mind', namely an argument of Hume's from perceptual relativity (which Reid deals with very neatly, and shows to depend on an ambiguous middle term) does not conform with claim (2). In addition, Reid's claims to completeness have to be treated with due scepticism, for as Grave remarks (60, p.25)

> Most of [the] familiar reasons for a theory of ideas were curiously ignored by the philosophers of the Common Sense school. They are all silent about the objects of false beliefs and memories.

Given that claim (2) fails for these reasons, claims (1) and (3), and so also (α), likewise fail. But just as claim (2) can be reinstated (if a little more cautiously stated) by enlarging upon the second principle, so also (1) and (3) and (α) can be reinstated. (This makes Reid's claim directly comparable with, and an anticipation of, those of chapter 8, §8.)

The argument Reid offers for (1) and (3) is far from sufficient, but it indicates the direction of travel:-

> It is by these (two) principles that philosophers have been led to think that, in every act of memory and conception, as well as of perception, there are two objects - the one the immediate object, the idea, the species, the form; the other the mediate or external object. The vulgar know only of one object ...
>
> These principles have not only led philosophers to split objects into two, where others can find but one, but likewise have led them to reduce the three operations now mentioned to one, making memory and conception, as well as perception, to be the perception of ideas (p.369).

Let y-ception be an arbitrary mental operation, e.g. one of Reid's favoured trio, conception, memory, perception, or cases of these such as imagination or olfaction, or yet again, foresight, telepathy, etc. (Very approximately, 'y' is replaceable by 'per', 'con', 'auditory per', etc. The notation implies no offensive reduction of operations to one, but facilitates some legitimate generalisation.) As argued already, y-ception always has an object to which it applies (the application of the function[1] is indicated prepositionally, most commonly with particle 'of'). But the obvious and ordinary objects of mental operations are not references; commonly they do not exist (even at some time), invariably they are not transparent, and they are not Brentano-related to that which operates, e.g. they are not physically acted on (by the y-ceptor) in the operation. Therefore, by the Reference Theory, there must exist references in the case of each operation. Hence there exist objects - Reid's second objects - distinct from the ordinary objects of mental operations (such as kings and dungeons and round squares) which are not pure references. These referents are uniformly supplied whatever operation y-ception is.

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[1] As for why the Reference Theory is entrenched, the story resembles that of other sweeping theories. The motives are not only (or always even importantly) philosophical, but social and political: see e.g. ENP.

The more detailed arguments that the obvious or ordinary objects of perception are (referentially) defective rely, naturally, on sceptical-style arguments; and different arguments for ideas (in the philosophers' technological sense) result according as different sceptical arguments are pressed into service. A familiar one among more detailed arguments runs, when generalised and set out more explicitly, as follows:-

1. Both [true] y-ception and false y-ception occur, i.e. there are cases of both types. ('True' and 'false' are partitioning adjectives sometimes applied as regards memory, perception and imaging; but sometimes 'true' is deleted, i.e. y-ception is made into a so-called success term, and sometimes other adjectives replace 'true' or 'false', e.g. 'veridical', 'mistaken'.)

2. There are no intrinsic marks of true y-ception (which would distinguish true y-ception).

Hence, by virtue of the intended sense of 2,

$2^{\dagger}$. The objects of true y-ception must be of the same sort as the objects of false y-ception.

3. The objects of [true] y-ception must exist; on modern prejudices, they must be referents, transparent entities.

4. The apparent objects of false y-ception do not exist, at least in the form y-cepted.

3 is taken to be entailed by the notion of [true] y-ception, 4 by the notion of false or mistaken y-ception, and 2 is often claimed as a matter of brute fact (supporting arguments typically take the form of issuing a challenge to produce internal criteria, and refuting any that are produced along with more likely-looking candidates). By 3 and 4,

5. There must exist some surrogate objects - call them y-ideas - which are the real objects of false y-ception.

By $2^{\dagger}$ and 5,

6. y-ideas are also the objects of true y-ception.

Hence

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[1] The operations are functions under Leibnitz-identity, not under extensional identity.

7. The real objects of y-ception are always y-ideas.[1]

It is corollary that y-ideas exist, and are transparent; they are (in this sense at least) clear and distinct.

It remains to show that the referents arrived at (y-ideas) have the further basic property of ideas, namely immediacy. Presumably Reid thought that the principle of cognitive contact (so far unused) yielded the immediacy feature. But for immediacy in the issued sense of 'without intermediary' the principle is not really required. For suppose z is the referent of y-ception and there is no immediate referent, under some presupposed ordering relation ≤; then z is immediate referent. If z is not immediate, consider some "more immediate" referent y and reapply the first argument, repeatedly. Either an immediate referent at some stage results or a sequence of progressively more immediate referents ordered under ≤ results. This sequence is bounded above, by the y-ceiver's mind on the usual view, hence it has a least upper bound, which is then the immediate referent. There are two hitches to this. Firstly, the argument does not prove contiguity, in the sense of adjacent interaction of the y-ceiver's mind and the referent. Perhaps this is not an essential feature of the notion of idea - on historical accounts (subsequently adopted) it is not.

Secondly, the argument assumes some properties - very plausible properties - on the ordering relation and its field (more in fact than are needed to select, all that is required, a nearest referent); but some further assumption seems to be required in any case to make the argument tight. For there is a problem in applying the principle of cognitive contact to clinch the case, namely that it is not immediate that the immediate referent yielded by that principle is the same as the referent of y-ception delivered by the second (ideal substitute) principle. There are several ways out of this problem, of varying satisfactoriness. Least satisfactory, simply introduce a bridging assumption, that the referents coincide. Better, assume or argue that the mind acts on the y-idea and apply Clarke's argument for contiguity. More specifically, the argument applies the two principles:

(PC) The mind^E acts on, or interacts with the referents of mental operations;

(UC) No entity (physically) acts or is acted upon where it is not located.

(UC) is the principle underlying Clarke's argument, and (PC), the bridging principle, is an appropriately referentialised version of the principle of cognitive contact. Perhaps best, reverse the arguments: first apply the cognitive contact argument, referentially construed (its intended construal given that minds are supposed to exist and to interact with their immediate objects), to obtain an immediate object of y-ception with the interaction property; then apply the argument previously given, leading to y-ideas, to show that the ordinary, commonly external, objects of y-ception are distinct from these referents. Observe that the principle of ideal substitutes now follows; but of course the second argument uses (or presupposes in one of its premisses, viz.3) the Ontological Assumption.

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[1] Reid himself is in some trouble with arguments of this sort applied to memory and (cases of) perception. For he insists upon a variant of premiss 3: but then a kind of y-ception can be defined to guarantee both premisses 3 and 4, and premiss 1 can hardly be disputed.

There is just one detail to complete, the requisite definition of 'idea'. When defined, ideas have almost always been defined as that whichs. Such a characterisation was offered by Locke 75, e.g. p.47 'whatever it is, which the Mind can be employed about in thinking', also 'whatsoever is the Object of the Understanding when a Man thinks'; but the characterisations are not wide enough for Locke's own subsequent purposes, for instance for ideas of sensation (especially in cases when 'men think not', p.113). Better is Reid's account of ideas as the immediate existing objects of mental operations of cognition in the wide sense. Similar characterisations of sense data have been given this century, for example Moore's definition as 'whatever is directly perceived is sensory experience' (for this and other recent accounts see Smythies 56, p.5 ff.). Along the same lines, let us define an idea as that which is the immediate referent of y-ception of some sort (i.e. idea is defined by abstraction or description). The arguments presented show - given the underlying assumptions of cognitive contact and the Reference Theory - that there exist such objects. Hence, on the same assumptions, the ideal hypothesis follows. Thus slightly modified forms (the modifications being in the principles) of Reid's (1), (3) and (α) do hold.

What fills the place left upon the demise of the theory of ideas (and with it empiricism)? Evidently the theory of items can replace the theory of ideas. In Reid's view it is commonsense which replaces the theory of ideas, but it is commonsense reinforced by principles of the theory of objects. Facets of the theory of objects appear not only in Reid's critique of the ideal hypothesis, but elsewhere in Reid's work, in particular in his view that mathematics is existence-free (already discussed), in his theory of universals, in his account of conception, and in his rejection of the thesis that we cannot conceive the impossible.

Against 'the authority of philosophy, ancient and modern' Reid advances the truth - of which he says: 'I know no truth more evident to the common sense and to the experience of mankind' (p.368) - that one may conceive things, such as centaurs, that never existed and also things that are impossible[1]; he says further that one may think and reason about such objects, and generalise and particularise about them. Despite commonsense, things have not advanced that much among philosophers since Reid's day. Grave, who has made a careful study of Reid's work, makes very heavy weather of Reid's straightforward and lucid remarks about being able to conceive what does not exist.

> What does Reid mean when he says that a centaur is the direct object of the conception of a centaur and that there are no centaurs, that the circle does not exist and is the direct object of the conception of it? One would like to be quite sure that Reid himself knew even vaguely. He goes on to speak of our conception of objects that do not exist as if he had said something perfectly straightforward, as though there was no appearance of self-contradiction in it which needed to be explained away (Grave 60, p.36).

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[1] According to Reid (p.407),

> I can conceive a thing that is impossible, but I cannot distinctly imagine a thing that is impossible.

Acquaintance with etchings like Escher's cast considerable doubt on the latter concession to the traditional rationalist-empiricist opposition.

Grave has imported assumptions from the Reference Theory that Reid rejected. Even what Reid is said to say is recast in these terms, thus giving the appearance of contradiction (in the first part of the first sentence). For what Reid said was that there exist no centaurs, i.e. no centaurs exist (cf. Grave p.34). Reid would not have said 'there are no centaurs' meaning 'no centaurs are objects', for he explicitly said, to quote Grave (p.54), that every conception 'must have an object', because every conception is 'of something', and went on to say that the object of a conception of a centaur is a centaur, whence it follows that (some) centaurs are objects. Once the distinction between existentially-loaded and neutral quantifiers, which Reid found quite straightforward, is seen, no appearance of contradiction remains and no explaining away is required. Similarly, that the circle is an object which does not exist, only gives an appearance of self-contradiction if objecthood is mistakenly taken to imply existence (i.e. a principle like OA is imported).

Grave then goes to considerable trouble (60, p.36ff) trying to interpret what needs no interpretation. As one might by now expect, these "interpretations" are attempts to reset what Reid says within the scheme of the Reference Theory. But Reid has dismissed that Theory along with the system of ideas. None of the interpretations Grave proposes are (as he virtually admits) satisfactory. Reid was not 'providing nonexistent objects of conception with a "subsistence" somewhere between being and nonentity' (p.36); he was not relying on a metalinguistic translation taking 'conceive of a' into 'understand the word 'a'' which would remove nonexistent objects in favour of words without application to anything, i.e. anything^E. (Grave's less probable interpretation, p.36); he was not relying on a Lockean reduction of individuals which do not exist to complexes of properties, in Grave's terms (his 'more probable' interpretation, p.40):

> when we think of some individual thing which does not exist, a centaur for example, we are presumably combining pure universals in thought and giving them this reference.

Grave thinks a similar reconstrual is required from Reid in the case of imagined objects, since in Reid's view, 'imagination is a species of conception': in the case of a rose seen but unremembered

> the characters of real things are before the mind ... but formed into unreal combinations - a centaur pictured is an unreal combination of real components (p.43).

The less probable interpretation, which 'cannot claim much support from anything he [Reid] says' (p.37), means that 'the principle which Reid regards as axiomatic, the principle that every conception must have an object' 'has to be given up' (p.36) - or somehow satisfied by words. Neither option would have satisfied Reid: neither option has much to recommend it (as explained in chapter 4). The more probable interpretation depends on a misinterpretation of Reid's views on universals, which imply that universals do not exist. Since universals do not exist, neither do combinations, so the combinations cannot supply the reference Grave assumes. Again the misinterpretation is the result of importing referential assumptions: with the result that Grave has trouble comprehending how Reid can speak intelligibly of and ascribe properties to universals which do not exist. Not surprisingly then, he has a considerable struggle to make sense of Reid's theory of universals.[1] The struggle begins with the remark that Reid 'then begins to speak obscurely of the nonexistence of universals' (p.38), and ends, unsuccessfully, on this note:

> One looks carefully through Reid for something that makes intelligible the notion of a world, populated by abstract entities or possible predicates in timeless relations and deprived of any kind of being. There is nothing at all (p.40).

But that was not Reid's position: on Reid's view, universals do not exist, so, though they are objects of conception, and abstract objects at that, they are not abstract entities, and they do not "populate the world".

Reid's actual views on universals are presented. primarily, in several brief but important statements in his essays on conception and abstraction (1888, pp.360-412) - beginning with the account of conception of nonexistent objects (p.368) and with the rejection (already noted of a case of the Ontological Assumption as one of the foundations of the erroneous system of ideas, a rejection which makes logical space for objects, like universals, which can stand in immutable relations without existing. The core of Reid's view is that

> ... all that is mysterious and unintelligible in the Platonic ideas, arises, from attributing existence to them. Take away this one attribute, all the rest, however pompously expressed, are easily admitted and understood (p.371; similarly p.404).

As to how, Reid explains through an example - which serves at the same time to illustrate Reid's view of the objects of mathematics -

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[1] The struggle issues in results like this:

> on Reid's view of the nature of universals, it will turn out to be as misleading to say that universals which have instances do not exist as that they do (p.35).

On the contrary, it is not at all misleading to say that Universals do not exist; but, Reid is prepared reluctantly to concede (p.407), they may be said to exist in - much better, they may be instantiated by - individuals. Reid makes the customary distinction between a universal, e.g. whiteness, and its instances, e.g. the whiteness of this sheet. The first implies no existence, the second Reid allows can exist (it is a particular state-of-affairs). Thus on the conceded sense, universals exist in the individuals they instantiate where the instantiating state-of-affairs exists. (The doctrine is therefore not that Grave takes it to be in the middle paragraph of p.39.)

It has already been argued (in 8.9) that the 'exists in' terminology is unfortunate, and misleading since it suggests (what is wrong) an immanent theory of universals. Reid's view appears to be similar; for he at once adds

> this existence ... in some existing individual subject ... means no more but that they are truly attributes of such a subject (p.407; my rearrangement).

Certainly some accomodation has to be made, on almost any theory of universals, for the popular sense in which some species are said to exist, others

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> Take, for an instance, the nature of a circle, as it is defined by Euclid - an object which every intelligent being may conceive distinctly, though no circle had ever existed; it is the exemplar, the model, according to which all the individual figures of that species that ever existed were made [better, conform]; for they are all made according to the nature of a circle. It is entire in every individual of the species, without being multiplied or divided. For every circle is an entire circle; and all circles, in as far as they are circle, have one and the same nature ... It is the essence of a species, and like all essences, it is eternal, immutable, and uncreated. This means no more but that a circle always was a circle, and can never be anything but a circle. It is the necessity of a thing, and not any act of creating power, that makes a circle to be a circle (p.371; a briefer presentation of some of these points appears on p.404).[1]

Platonists

> were led to give existence to ideas, from the common prejudice that everything which is an object of conception must really exist; and having once given existence to ideas, the rest of their mysterious system about ideas followed of course; for things merely conceived [need] have neither beginning nor end, time nor place ... (p.404).

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to no longer exist, and so on. But this can be done with ordinary terms which need carry no commitment to the external existence of species, such as 'extinct' and 'not extinct' (or 'represented' or, more dangerously, 'extant'). A species is extinct if it did have members that existed but no longer has members that exist.

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[1] Reid suggests an ingenious application of this theory to solve two puzzles in the philosophy of religion that the Platonic system and systems like it generate: (1) that the role of God is much diminished, for 'nothing is left to the Maker of this world but the skill to work after a model' that already exists independently of Him and in greater perfection and beauty than anything he can produce, and (2) that arguments from design for the existence of God are 'destroyed by the supposition of the existence of a world of ideas, of greater perfection and beauty, which was never made, (p.371). The puzzles are removed 'if it be true that the Deity could have a distinct conception of things which did not exist, and that other intelligent beings may conceive objects which do not exist' (p.372); and so are removed with 'the common prejudice that everything which is an object of conception must exist' (p.404).

Also simply resolved are

> the intricate metaphysical questions that ... agitated ... the philosophers till about the twelth century ... such as, whether genera and species do really exist in nature, or whether they are only conceptions of the human mind. If they exist in nature, whether they are corporal or incorporal; and whether they are inherent in the objects of sense, or disjoined from them (p.406, my rearrangement).

Similarly resolved are the questions which exercised philosophers after the revival of learning, as to whether universals were particular or general ideas. The answer, in each case, is neither. There exist no 'general ideas either in the popular or in the philosophical sense of that word',

> because everything that really exists is an individual.[1] Universals are neither acts of the mind, nor images in the mind.[2] ...
>
> A Triangle, in general, or any other universal ... is not an idea, nor do we ever ascribe to ideas the properties of triangles. It is never said of any idea that it has three sides and three angles. ...
>
> Ideas are said to have a real existence in the mind, at least while we think of them; but universals have no real existence. (p.407)[3].

Just and true though most of this is, Reid has somewhat overstated his result in claiming that 'all the mystery is removed'. Granted the existential problems concerning universals are removed (at least for most ordinary intelligent people, who, unlike philosophers, are not caught in the grips of the Reference Theory); but the other puzzles or mysteries concerning universals, such as the Third Man (and other puzzles considered in 8.9) are not thereby removed.[4]

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[1] On the view defended in chapters 8 and 9, particular, not individual.

[2] The conclusion Reid draws from this, 'that we cannot, with propriety, be said to have abstract and general ideas' in either sense, does not follow, either on the theory of items or on Reid's view. For what does not exist can be conceived, and, in certain cases, had. But though universals - which do not exist - can be distinctly conceived (p.407), they cannot of course be significantly had.

[3] It is at this point that Reic introduces, only to immediately eliminate again, the 'exist in' terminology (already discussed), to account for the sense in which species are said to exist.

[4] There is much excellent discussion in Reid of philosophers' opinions on universals, we shall have to pass over as not of immediate relevance. For example, Reid does a splendid hatchet job on Hume's sentiments and in particular on Hume's amazing (but nonetheless referentially entirely expected) theses 'that it is utterly impossible to conceive any quantity or quality, without forming a precise notion of its degrees', and 'that it is impossible to distinguish things that are not actually separable' (see p.410).

Nor does Reid really think that all mystery is removed; for he proceeds in an interesting section (1.4, pp.363-5)[1] to compare conceptions of universals with 'copies which the painter makes from pictures done before', the copies in the case of conceptions of universals being taken from 'the conception or meaning which other men, who understand the language, affix to words" (p.364) - a dubious and unnecessary doctrine that he at once attempts to back up with an inadequate conventionalistic (and chauvinistic) account of sortals and general names and the universals they signify.

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[1] Reid divides 'our conceptions' into

> three kinds. They are either conceptions of individual things ...; or they are conceptions of the meanings of general words; or they are creatures of our own imagination: and these different kinds have different properties ... (p.365).

In his fuller account, of which the foregoing is a summary, Reid relies on

> a very strong analogy, not only between conceiving and painting in general, but between the differentials of our conceptions, and the different works of painters (p.363).

Conceptions, like paintings, are either

a. not copies or

a* copies,

> because they have an original or archetype to which they refer, and with which they are believed to agree; and we call them true or false conceptions, according as they agree or disagree with the standard to which they are referent. These are of two kinds which have different standards or originals:
>
> b. (they are conceptions) 'of individual things that really exist,

and are 'analogous to pictures taken from the life';

> b* of universals.

It is the discussion under division a of 'conceptions which may be called fancy pictures' that merits note.

> They are commonly called creatures of fancy, or immagination. They are not [or may not be] the copies of any original that exists, but are originals themselves. Such was the conception which Swift formed of the island of Laputa, and of the country of Lilliputians; Cervantes of Don Quixote and his Squire; Harrington of the Government of Oceana; and Sir Thomas More of that of Utopia. We can give names to such creatures of imagination, conceive them distinctly, and reason consequentially concerning them, though they never had an existence. They were conceived by their creators, and may be conceived by others, but they never existed. We do not ascribe the qualities of true or false to them, because they are not accompanied with any belief, nor do they imply any affirmation of negation (p.363, emphasis added).

Only the last sentence of this otherwise admirable passage calls for comment and qualification. The objects are not true or false (in the relevant sense)

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Corollories of the thoroughgoing rejection of the system of ideas are by no means confined to resolutions of (gratuitous) problems concerning universals and perception. Another corollary is the rejection, which Reid shared with Meinong, of empiricism.[1] Many too are the philosophical paradoxes and sophisms that are removed with the rejection of the system of ideas.[2] Reid mentions (p.306)

> several paradoxes, which Mr. Locke, though by no means fond of paradoxes, was led into by this theory of ideas. Such as, that the secondary qualities of body are no qualities of body at all, but sensations of the mind: That the primary qualities of body are resemblances of our sensations: That we have no notion of duration, but from the succession of ideas in our minds: That personal identity consists in consciousness; so that the same individual thinking being may make two or three different persons, and several different thinking beings make one person: That judgment is nothing but a perception of the agreement or disagreement of our ideas. ...
>
> However, all these consequences of the doctrine of ideas were tolerable, compared with those which came afterwards to be discovered by Berkeley and Hume:- That there is no material world: No abstract ideas or notions; That the mind is only a train of related impressions and ideas, without any subject on which they may be impressed. That there is neither space nor time, body nor mind, but impressions and ideas only: And, to sum up all, That there is no probability, even in demonstration itself, nor any one proposition more probable than its contrary.
>
> These are the noble fruits which have grown upon this theory of ideas, since it began to be cultivated by skilful hands. It is no wonder that sensible men should be disgusted at philosophy, when such wild and shocking paradoxes have, with great acuteness and ingenuity, been deduced by just reasoning from the theory of ideas [and so from the Reference Theory], they must at last bring this advantage, that positions so shocking to the common sense of mankind, and so contrary to the decisions of all our intellectual powers, will open men's eyes, and break the force of the prejudice which hath held them entangled in that theory.

(footnote continued from previous page)

because they are not copies, so there is no question of agreement of or disagreement with the original. There may however be beliefs about them, but not, except of those who are mistaken, as to their existence. But affirmations and negations concerning them are implied by data their source books supply.

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[1] Reid's rejection of empiricist principles is not as systematic or complete as that of noneism: see, e.g. Reid's thesis as to the ingredients to which conception must be confined (p.367).

[2] Only some of the range of paradoxes indicated, which are likewise removed with rejection of the Reference Theory, have been examined in this book. That gives some idea of the scope for further philosophical application of the theory of ideas.

§2. *How the theory of items differs from Meinong's theory of objects: a preliminary sketch.* The theory of items outlined has not aimed at being faithful to Meinong's theory of objects: nor should it have so aimed, since important logical and semantical tools are now available which were not accessible to Meinong. It is no criticism then of the theory of items that Meinong said something different or that his theory of objects is unclear or indeterminate at places where the theory of items is not (or vice versa).

Although there are very considerable and important areas of agreement between Meinong's theory of objects and the theory of items, for example on the theses presented on pp.2-3 and their elaboration, there are also many differences, some of the more noteworthy of which are then following:-

1. Subsistence. Meinong's talk of the subsistence of objects, of objects which do not exist, is entirely abandoned. There is, on the theory of items, only one way of being, that is existence in the space-time world; there are no alternative ways of being, or of existence, such as subsistence may be taken to be. Subsistence has no role in the theory of items. (To be sure, 'subsistence' retains its usual meaning as in 'subsistence farming', 'subsistence levels', but such matters have little to do with objects in Meinong's sense of 'object'.)

Part of the attribution of subsistence theses to Meinong is no doubt due to misconstrual of his claims, misconstrual reflected in mistranslation. A blatant example is the following, drawn from Grossman (MNG, p.69ff.), who imposes a subsistence position on Meinong under the guise of translation:

> Certain entities are said to exist, while othere are claimed to obtain. For purposes of translation, I shall from now on call the second role of being, the being of ideal objects, subsistence. Real objects are said to exist, according to this convention, while ideal objects merely subsist -

or what should have been said, they obtain.

But some is not due to misattribution. Meinong, unlike Reid in respect of universals, did not entirely free himself of subsistence theses and unnecessary existence claims (and perhaps even of a weak version of the OA). Nonetheless, in almost every case these subsistence and existence claims can be removed, and the requisite distinctions and points made neutrally. Part of the argument for this thesis has already been given (p.4), namely the cases concerning number and concerning objectives.[1] Other cases are as follows:- Consider first the airship which exists now and thus which, according to Meinong, subsisted at some previous dates (UA, p.74). It is decidedly preferable to say that the airship which now exists was such, at previous dates, that it did not yet exist but would exist, i.e. it was that it will exist. More generally, instead of saying that objects that at some time exist subsist, it can be simply said that they at some time exist, or, equivalently (but somewhat misleadingly), that they have sometime existence.

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[1] The question of the subsistence of objectives is taken up again in (3) below.

2. Hierarchies of being. Like the subsistence terminology, Meinong's talk of the being of objects is shunned in the theory of items. It is too easily misinterpreted - being too readily suggests, or does imply, existence - and so it is an asset and point of leverage for the referential opposition. Moreover the extensive use of the being terminology, especially in connection with objectives, derives from a mistaken assimilation of truth to existence, an assimilation much encouraged by referential thinkers such as Brentano. The idea - the mistaken idea - is that whether a proposition is true or not is like whether an object exists or not, a resemblance that can be enforced either by a suitable definition of the existence of propositions - as those that are true, in which case (intensional attitudes such as belief of) false propositions reactivate the "riddle of nonbeing" - or by transformation of propositional discourse into objective discourse in Meinong's fashion. But in the theory of items whether a proposition is true or not has nothing to do with whether it exists, or has being, or not.[1] No proposition exists or has being (see 1.24 and chapter 9), but many propositions (on usual reckoning, half of all propositions) are true.

The misleading being terminology should accordingly be paraphrased out. Talk of kinds of being should be phased out in favour of talk of kinds of objects.[2] The change is of course not merely a change in terminology; it reflects a change in theory, and probably in ontological commitment. An instructive example will reveal how, and how the change, at first sight a change in terminology, deflates Meinong's hierarchies of being. Consider Chisholm's exposition of one of the more baroque parts of Meinong's theory:

> Since there are horses, for example, there is also the being of horses, the being of the being of horses, the nonbeing of the nonbeing of horses, and the being of the nonbeing of the nonbeing of unicorns ... (72, pp.25-6).[3]

There are two cases according as the premiss "There are horses" is existentially-loaded and is equivalent in context to "There exist horses" (as Chisholm no doubt supposes), or is not but amounts to no more than "Some objects are horses".

Case 1: Since there exists horses but not unicorns, it is true that there exist horses, and that horses exist, but not true that there exist unicorns; alternatively, it is a fact that horses exist and a fact that unicorns do not. But no hierarchy is induced. For it is true that A iff A, i.e. iff it is a fact that A, etc. 'It is true that' and 'it is a fact that' may be reiterated indefinitely, but redundantly by virtue of the implications. What of the claims 'There exists the existence of the existence of horses' and 'There exists the existence of the nonexistence of the nonexistence of unicorns'?

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[1] The paraconsistent theory of items outlined further widens the gulf between truth and existence. For while consistency is required for existence it is not for truth.

[2] Kinds-of-existence and kinds-of-truth doctrines should be similarly eliminated in favour of categorical distinctions of objects, it can more generally be argued. For they simply double up, in a misleading way, on categorial distinctions already presupposed.

[3] There are on Meinong's theory only two varieties of being, existence and subsistence (Aussersein it is sometimes suggested as a third: see 5. below). But there does not mean that judgements of being cannot be iterated, indefinitely.

It is very doubtful that the functor 'the existence of' significantly iterates as applied to subjects (and objective terms). It seems best to say, with the theory of items, that it does not, that the significance range of the phrase-forming functor 'the existence of ...' is confined to bottom order subjects. Insofar as the claims do make any sense, they convey no more information than '(It is true that) horses exist' and '(It is true that) unicorns do not exist'.

Case 2: Since some objects are horses it is the case that included among objects are horses. No existent objects are unicorns, so (even though unicorns are objects) unicorns are not included among existing objects. The linguistic means for progressing up Meinong's hierarchy are, for excellent reasons not available.

Other Meinongian hierarchies similarly collapse; e.g. the hierarchies of factuality and unfactuality (of Mög, c.p.291) are easily deflated since superordinate objectives (generated by such functors as 'It is a fact that' or 'That ... is factual') coentail certain initial objectives. But some of the hierarchies with which Meinong appears to have been in stuck arose from the explanation he gave of the way in which objects acquire their existence, namely 'by virtue of superordinate objectives' (Findlay 63, p.102). This vexed issue is taken up again in and following the discussion of the 'indifference to being of the pure object', after other leading characters that figure in the issue have been introduced.

3. Higher order objects, and exorcism of the kinds of being doctrine. An object of higher order is one which is 'built upon' and presupposes other objects.

> Among objects, there are some that have an intrinsic lack of independence; thus diversity, for example, can only be thought of in relation to differing terms. Such objects are based on others as indispensible presuppositions (Russell 04, p.207).

From examples Russell concluded Meinong had the following class of objects in view:

> they are relations, the complexes formed of terms related by relation, and the kind of objects (which we may call plurals) of which numbers other than 0 and 1 can be asserted (p.207).

But Russell omits a crucial class, objectives: 'The objective that snow is white is built upon or presupposes the object snow which is therefore its material' (Findlay 63, p.71). As Russell observes, 'there are certain difficulties about ' Meinong's brief characterisation of higher order objects (even omitting plurals), namely

> They have an internal lack of independence in their nature; they are built on other objects as indispensible presuppositions (Russell, p.207).

Two of the difficulties discerned arise however from serious deficiencies in Russell's own logical theory: his points have a very modern ring. The first is that Meinong's characterisation

> is based upon logical priority ... [but] logical priority is a very obscure notion ... which a careful discussion tends to destroy. For it depends upon the assumption that one true proportion may be implied by another and not the other by the one; whereas, according to symbolic logic, there is a mutual implication of any two true propositions (pp.207-8).

The second difficulty is of a rather similar order:

> it seems impossible to distinguish, among true propositions, some which are necessary from others which are mere facts ... . Throughout Meinong's work, in many crucial points, use is made of the notion of necessity; and some of his most important arguments fail if necessity is not admitted (p.208).

Meinong's theory is intensionally based and requires, for its formal elaboration, what is not difficult to supply, not merely a theory of logical modality, but to meet the first "difficulty" properly, a theory of entailment. Then A is logically prior to B (under the determinable Russell indicates) iff $B \Rightarrow A \,\&\, \sim(A \Rightarrow B)$.

Russell's third difficulty is more serious, that a relation 'appear to be capable of being thought of apart from its terms' (p.209). As this is true, Meinong's more psychological characterisation of higher order objects should be avoided. The examples Meinong offers of the higher order objects lead to other difficulties (cf. p.6 above). The examples include not only four nuts (for they 'presuppose each of the nuts') and melodies, but, what is also a source of considerable trouble, a red square, said to be compounded of a shape and a colour. For in a similar way any object descriptively presented could be said to be of higher order since compounded from (simpler) properties, e.g. the round square, the golden mountain, Kingfrance, Manfibo. This indicates that Meinong's division, if pressed, would all too easily result in an atomism. Such examples as the melody lead in the same direction. Any process composed of elements (i.e. all processes, suitably viewed) would, like an individual melody, be of higher order; and more generally anything composed of anything else would be of higher order. The only elements would be Wittgenstein's simples (duly criticised in Wittgenstein 53). Accordingly, Meinong's distinction of orders has not been pressed: the distinction needs not merely sharper characterisation, but reorientation. For every purpose however for which the distinction has been drawn upon in this text the following (non-exhaustive) division suffices: every particular item is a bottom order object; and every abstract item (characterised by abstraction) is a higher order object.

Meinong's earlier theory was seriously overloaded with attributions of being of one kind or another to nonexistent objects; nor were they entirely eliminated from the later theory (as will be seen). A striking example is the doctrine of Quasisein, according to which every object had, as on Russell's earlier theory (criticised in 4.1), a (peculiar) kind of being with no contrary, quasi-existence. By 1899 Meinong had abandoned this doctrine in favour of the doctrine of Aussersein, to be considered below, according to which the pure object stands beyond existence (being) and nonexistence (non-being), both of which are, in some sense, external to it. Whether an object exists or not makes no difference to what it is, to its characterisation. (See further the discussion of Quasisein and Aussersein in Findlay 63, pp.47-50).

But although the thoroughly rotten kinds of being doctrine was largely removed from Meinong's theory of bottom order objects of objecta, it was not exorcised from the theory of higher order objects but remained to haunt it, to its cost. For example, factuality is said to be a kind of being peculiar to objectives, and even unfactual objectives are assigned being of a sort. But the assumption of being is as otiose and damaging here as it was in the case of bottom order objects. It suffices to say that objectives obtain, or are the case, or not: this inputs being no more than truth inputs existence to propositions.

The factuality of objectives is, according to Meinong, an example of the subsistence of higher order objects.

> If the existence of the Antipodes does not itself exist, its nonexistence is nevertheless not on a level with the nonexistence of the phoenix; it has a certain sort of being ... . For this type of being Meinong employs the word subsistence (Bestand) ... Objectives are not the only subsistents: a relation such as diversity subsists between two entities, and the number of a group of existents subsists, but cannot exist as they do (Findlay 63, p.74).

Meinong regarded the difference between the two varieties of being, existence and subsistence, as fundamental, unanalysable and as irreducible as the difference between yellow and blue. Again the subsistence doctrine, which is entirely rejected by the theory of items, is as unnecessary as it is damaging. For example, instead of saying that relations between entities subsist, it is enough to say that a relation is actually instantiated iff it does hold between entities. Similarly every other use of the subsistence terminology, which is invariably introduced by way of admissible nonsubsistence terminology, can be (better) paraphrased away, mostly along the lines of the original introduction, but not always. The nonexistence of the existence of the Antipodes, for instance, is not on a level with the nonexistence of the phoenix, because it involves a second (and dubiously significant) iteration of the "(non)existence of" functor. "Subsistence" always reduces to other attributes of objects. The notion is not fundamental but analysable, case by case, for different sorts of higher order objects. There is only one kind of being, existence, and higher order objects, such as universals, simply do not exist, as Reid explained. Such objects have no kind of being at all. According to Meinong however (GA II, p.395; Mög, p.169), 'properties of existents and some relations between existents (the 'real' relations) themselves exist' (cf. Findlay 63, p.67). On this point the theory of items is characteristically opposed to Meinong's theory of objects, which is here overtly platonistic. By the unified criteria for existence (cf. chapter 9), no such objects of higher order as properties of relations exist.

4. Objectives. Objectives, which are Meinong's replacements for propositions, have a central role in Meinong's theory of objects; they have a much diminished role in the theory of items. To be sure they can be introduced (cf. §3 below),[1] even if they do not have all the features they

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[1] A case for introducing objectives can be made directly from consideration of the objects of such intensional discourse as 'Passmore was worried by the city's being so ugly', 'The seminar focussed on the nonexistence of the round square'.

Naturally objectives have extensional properties as well, e.g. that specified by the predicate 'is a fact', that helps mark out objective terms.

present themselves as having or Meinong presents them as having, such as being. What is under suspicion is Meinong's motivation in introducing them, for instance in such ways as the following: if one judges that some swans are black, there is an object in virtue of which one's judgment is true, namely the objective, the being of black swans. It looks as if it is being assumed, much as on Brentano's defective theory of judgments, that every objective is duly existential, an attribution of existence or nonexistence to an object. In short, it looks as if the theory is set up in the very type of framework it should have renounced, as excessively referential, at the outset. Truth and factuality are explained through objectives of existence or nonexistence, instead of the other way round.

> Again, if I judge that the round square does not exist, my judgement is true, not in virtue of the round square (for there is no round square), but in virtue of the non-being of the round square; this Objective - the non-being of the round square - also subsists (Chisholm 60, p.6).

Again the extra ontological baggage is unnecessary, and undesirable. The judgment is true simply because the round square does not exist, or, if you like, because the round square has the property of not existing. A theory of truth which is not existentially or referentially biassed can account for all such cases.

There is, it may be said, a fundamental reason for objectives (as bearers of factuality) as supplanting propositions (as bearers of truth); that is, that objectives appear to get rid of propositional middlemen, intervening between judgments and the facts. The appearance is misleading however, and objectives accomplish no significant elimination. For consider, for example, unfactual objectives, consider general objectives, consider intensional objectives, etc. The atomistic tie with the facts that objectives appear better fitted to accomplishing smoothly than propositions cannot be achieved. (The mapping of fact and language is not quite so simple, nor conveniently extensional.)

In the same way that a theory of propositions was developed in 1.24, so a logico-semantical theory of objectives could be devised. But it would be almost isomorphic to the theory of propositions (but see §3). This is why it is not too material that in the work of most expositors of Meinong writing in English objectives became, a little inaccurately, propositionalised in form; e.g. even where the objective terminology is retained, examples take the propositional form 'that A'.

5. Aussersein, and the principle of indifference of objects as such to existence. The doctrine of Aussersein, since a direct repudiation of the referential assumption that every object must have being of some sort, has not surpirsingly, been found very puzzling to adherents of the Reference Theory, some of whom have managed to stir up dust that has not yet subsided. But the core thesis is straightforward: 'existence and nonexistence are both external to' all objects as such, never part of the characterisation or nature of objects;

> the object as such ... stands "beyond being and nonbeing" ... the object is by nature indifferent to being (ausserseeind)(60, p.86).

This is the thesis of Aussersein of pure objects (den satz vom Aussersein des reinen Gegenstandes), commonly expressed in English as 'the principle of indifference of pure objects to being, (60, p.86). The doctrine is well explained by Findlay (63, p.49); but since the thesis is effectively part of the theory of items, and readily formally incorporated in it, it will help to explain it somewhat independently. The pure object, or object as such, is the object as given by its characterisation (its determinations of *Sosein*) and may be represented by its set of ch features. Let d be an object and C_d its set of characterising features, i.e. $C_d = \{\phi : \mathrm{ch}\phi \,\&\, \mathrm{di}\phi\}$. Then *the object d as such* is represented by C_d. Property ψ is *external* to the object d as such, ψ *ext* d for short, iff $\psi \notin C_d$. Hence $\vdash (d)(\lambda E \text{ ext } d \,\&\, \lambda{\sim}E \text{ ext } d)$, i.e. existence and nonexistence are universally external to objects: the thesis of *Aussersein* is a simple consequence of the fact that λE and $\lambda{\sim}E$ are not characterising features of objects.[1] Similarly possibility and impossibility are external to all objects. By contrast, characterising features such as redness and roundness (rd) are not: (Pd)~(rd ext d), etc. It is of some importance to distinguish what is *part of* a characterisation from what *follows from* an object's characterisation: nonexistence is not part of any object's characterisation, but the nonexistence of the round square follows from its characterisation.

An object as such is said to *be ausserseiend* or to *have Aussersein* (Findlay 63, p.49). That is, *Aussersein* is a property, and it is not difficult to say which: *Aussersein* $=_{Df} \lambda x(\lambda E \text{ ext } x \,\&\, \lambda{\sim}E \text{ ext } x)$, i.e. it is the property of objects as such, such that both existence and nonexistence are external to them. The definition is of course an explicative definition set within the theory of items. It follows, in the theory of items, that Aussersein does not exist, since no properties do.

Aussersein is not a kind of ontological status, it is not a kind of being:

> At times, Meinong was inclined to assume that there is a third state of being which belongs to everything.[2] But his *principal* view is that existence and subsistence [obtaining] are the only two modes of being. *Aussersein*, therefore, must *not* be conceived of as a kind mode of being. To say of the golden mountain that it has *Aussersein* does not mean that it has some kind of being other than existence or subsistence. Rather, it means, among other things, that the golden mountain has no being whatsoever .... Russell, by contrast, ... at first ... accepted the conclusion that the golden mountain must have some kind of being (Grossman MNG, pp.67-8; emphasis added).

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[1] As elsewhere λf, i.e. $\lambda x x f$, approximates in second-order theory properties, i.e. $\rho x x f$: see 1.18.

[2] Unfortunately Meinong's inclination in this direction is by no means an isolated phenomena or confined to early work, though the main example Grossman cites (p.67) is: but see also his discussion, p.119. There is an embarrassing passage in a late work:

> I believed and I still believe some being-like thing (*Seinsartiges*) ought to be attributed to [objects which lack *sein*] under the name of '*Aussersein*' (EP, p.19).

In addition, Dyche has ferreted out statements of an even more damaging character in Meinong's unpublished work e.g. (from 1903/4) 'The round

(Footnote continued on next page.)

Gram, however, makes the mistake of identifying Aussersein with having some ontological status (70, p.120). Gram is firmly locked into a referential framework: he does not see how one can have objects before one's thought without assigning them ontological status (p.113, n.6). The fact is that nonexistent objects have no ontological status (in the standard English meanings of the terms). It is false that Meinong

> argued for the ontological states of nonexistent objects. [That] Meinong was, on the face of it, arguing for a realm[1] of objects, which have ontological status though they lack being (p.124).

Gram goes on to claim that it is wrong to interpret 'Meinong as saying that Aussersein belongs to every object as such and not merely to some objects

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[2] (Footnote continued from previous page.)

square does not lack the positive: it is a kind of being - 'Aussersein' (76, p.135, p.197). In a later work (dated 1908) Meinong assigns, according to Dyche, a Seinsminimum, a minimum kind of being, even to irrealia such as a Pegasus (p.137). What makes this assignment especially awkward is what Meinong is supposed to say of the basic texts where he denies that Aussersein is a mode of being (namely Stell and 60):

> While Meinong says (footnoting the latter essays), he had been led to understand the term (Aussersein) in a merely negative sense, he now thinks that in having something as an object we always grasp something positive, even if it is only minimally positive (Dyche, p.136).

Dyche concludes, a little precipitously,

> It is clear that Meinong, like Plato, thinks in terms of degrees of reality (p.137).

Given the conflicting evidence it is far from clear. For a different construal can be put on the evidence; namely that Meinong was a philosopher in intellectual conflict who was, like Ryle (Concept, p.4), 'trying to get some disorders out of (his) own system' - facets of the Reference Theory - but without complete success, who was regularly, like the addict, tempted back to the referential. There is a good deal of historical evidence, e.g. Meinong's struggle over Quasisein, supporting this interpretation which, perhaps not too pretentiously, sees Meinong as a kind of flawed hero who breaks free of the morass of the referential only to slide back into it. Though it seems clear that the unpublished evidence (from 1908) needs more careful assessment (by some less interested parties than Dyche), there is no real ground to question its reliability; for it fits into the historical picture of prolonged struggle.

There is no need to demote Meinong because the position of the backsliding Meinong is quite incompatible with the theory of items (with M1). The limited hero Meinong, whose jungle we are exploring, whom Meinongians follow, was not a platonist, and did not join those who banqueted on the fruits of Zizyphus lotus outside the jungle on the plains of the eastern Mediterranean.

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[1] Realm is a term best avoided in neutral theory. It tends to carry existential loading; and it implies placement. But it makes no more sense to ask where Aussersein is than it does to ask where various nonentities are, e.g. where abstractions are.

rather than others' (p.125). Gram's claim is at flagrant odds with what Meinong has to say in 60, and with the way Meinong is interpreted by Chisholm (60, p.89), Findlay and others.[1] The criticism extends to the account given here since $\vdash$ (x)xi *Aussersein*. Gram argues that to so interpret Meinong 'is to impute a contradiction to him' (p.124). But Gram's argument rests on the following error: 'an object which ... is indifferent to being or beyond being cannot, in the very nature of the case exist'. From the fact that an object d as such is beyond being it does not follow that d does not exist. On the contrary, for some d, λE ext d & dE. Gram has erroneously supposed that if λE ext d then ~dE. Gram has, however, a second string to his bow, a further invalid argument, from the observation 'that *Aussersein* is not governed by the Law of Contradiction while existent and subsistent objects all obey that law' (p.125). Regrettably Gram proceeds to infer from the fact that *Aussersein* is not governed by the (subject-predicate form of the) Law - by which is meant that not all objects that have *Aussersein* satisfy the Law, i.e. that *some* do not - that *no* object with *Aussersein* conforms to the Lae, (which would contradict the fact that existing objects which as such have *Aussersein* conform to the Law). That is, his second argument rests on a *some* to *all* fallacy.

A not entirely unrelated, again referentially-based, interpretation is to be found in Rapaport, who makes things easier for himself by counting several of Meinong's statements (including those formalised) as 'metaphysical formulations' (78, p.157).[2] Rapaport's case, like Gram's, depends on a non-sequitur. Meinong

> concludes that 'neither *Sein* nor *Nichtsein* can be situated essentially in the object itself". The point of view which emerges here is that *Sein (or Nichtsein) is properly predictable only of objectives* (Rapaport, p.157).

Meinong's conclusion means only that the properties in question are not part of the essence or nature of an object as such (as the further text reveals). It would be a mistake to read his conclusion as saying that the properties were never essentially held, since nonexistence sometimes is. But even if it were read in that way, it would not justify Rapaport's inference, since existence and nonexistence could be still contingently had by objects - as they obviously are. Of the two drawbacks Rapaport finds in the doctrine of *Aussersein*, one, the spectre of an infinite regress, is a result of his misconstrual; the other reflects the referential drive that surfaces in Rapaport's own (ultimately trivial) theory:

> there remains the ever-present urge to say that, in some yet-to-be-explicated sense, objects must "be there" in order for them to be non-committally quantified over and to be objects of psychological acts (p.157).

If *being there* implies *being some place* or *having a location*, then the urge is irrational: luckily not all of us have it.

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[1] Gram's response: 'There are it must be admitted, misleading descriptions of *Aussersein* to be found in Meinong' (p.125, n.11).

[2] Lambert, who also gets the thesis of *Aussersein* wrong (mixing it up with existence acquisition conditions), likewise describes Meinong's notion of indifference to being as 'metaphorical', and as 'difficult' (73, pp.224-5).

There does however remain 'a small but irritating problem', which leads Findlay to say that 'the conception of *Aussersein* [earlier] sketched ... requires considerable modification' (63, p.102). Not so: the problem Findlay goes on to outline,[1] arises, not from the conception of *Aussersein*, but from another part of Meinong's theory, from the (existence) *acquisition thesis* that objecta only acquire (or have) existence, or nonexistence, by virtue of their inclusion in objectives. Findlay presents this thesis as if it were an immediate inference[2] from the thesis of *Aussersein*. But it is doubtful that it even follows. And it is doubtful that the acquisition thesis is true. Mere inclusion in an objective is evidently not sufficient for existence: it has to be both the right sort of objective ('...'s being red' is not) *and* the case. Moreover d's inclusion in a *factual* objective of the form '... existing' is not - except in a devious sense - the *reason* for d's existing. Rather it is the case *because* d exists.

There is, however, a *weaker* acquisition thesis which is true, that objects only have existence or nonexistence *when* (not because) the corresponding objectives attributing existence or nonexistence, respectively, to them - and so including them - are the case. The weak thesis suffices to preserve almost all the things Meinong has to say as to the relations of objects and objectives that contain them. With object a there are associated, in particular, two objectives, a's existing, represented symbolically a*, and a's not existing, -a*. The (ambiguous) notation is chosen to match exactly that of Grossmann MNG, pp.118-9, so that what is right in what Grossmann says can be taken over. In particular, the six 'things Meinong says about *Aussersein*' that Grossmann brings out can be brought out in Grossmann's way - or better. Consider, e.g., (1) 'the contrast between existence and nonexistence is a matter of the objective, not the object'. The contrast does not occur with mere consideration of the object, but in making the contrast we are automatically concerned with a's existing or not existing, i.e. with a* or -a*. (2) is the principle of an excluded middle, aE or ~aE, already a thesis. (3) is the point that the nature of an object sometimes implies its nonexistence. (4) is the thesis of *Aussersein*; and (5) is the contrasting thesis that the so-being of an object is internal to it. Simply define ψ*int*d iff $\psi \in C_d$. (6) is the following formula: 'the object contrasts with the object in that the former may, under favourable circumstances, *have* being, while the latter *is* itself being' (p.118). Under favourable circumstances, aiλE, i.e. a *has* existence, whereas an objective a* obtains i.e. in Meinong's terms, subsists, or *is*. Grossmann's conclusion from all this, that on 'Meinong's view on *Aussersein* ... there are no such [objects] as existence and subsistence' (p.119) is unwarranted, and mistaken (existence and subsistence are types of being, and accordingly objects).

6. *The modal moment, and the semantical factor, formalised*? Meinong's doctrine of the modal moment (which receives its fullest discussion in English in Findlay 63, p.102 ff.) is variously described as obscure, difficult and cumbrous. But the basic trouble seems to be that Meinong tries to combine, in

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[1] The problem outlined on p.102 differs from the 'small but irritating problem' mentioned which concerns the modal moment (i.e. modal factor), discussed below.

[2] Or even a restatement of the thesis, which may account for Lambert's confusion of theses, remarked upon in the previous footnote.

the one operator, two important but conflicting roles, namely roles both

(i) as a predicate modifier interconverting full-strength and substrength status predicates, and

(ii) as an internal semantical indicator (reflecting the state of the world $\underline{\underline{T}}$).

Interestingly, Findlay tends to view the modal moment in way (i), Grossmann sees it in way (ii) (MNG, p.222). Consider firstly role (i), which formally reflects the way Meinong introduces the modal moment, as the factor which makes the difference between full-strength and substrength factuality (between f and s(f), where $\sim(f \approx sf)$). The modal factor is restricted in Meinong's examples to status predicates, 'exists', 'is possible', 'is factual', and a similar restriction could be imposed formally. The modal factor applied to a predicate yields another predicate; that is, it is a function on predicates (wrt $\approx$), given, as can be assumed without loss of generality in the formal theory, that where $f \approx g$, $m(f) \approx m(g)$. It is also supposed that function m has an inverse, i.e. where $m(f) \approx m(g)$, then $f \approx g$.

To set things down exactly:- A symbol m is added to the working logic, subject to the formation rule: where f is a previous (status) predicate mf is a (status) predicate. The following postulates are adopted:

m1. m is a 1-1 function, i.e. the conditions above hold.

m2. $m(sf) \approx f$.

Axiom m2 implies the principle that substrength factuality plus the modal factor yields full-strength factuality (Mög, p.266). Similarly the modal factor applied to presented existence yields existence. Also $\vdash m^{-1}f \approx sf$, which implies that full-strength factuality minus the modal factor yields substrength factuality (Mög, p.266). Proof is this: $m^{-1}f \approx m^{-1}m(sf) \approx sf$. Thus m is what makes the difference between f and sf.

Furthermore, the theory can render logically correct Meinong's notorious response to Russell: the existent round square is existent, but it does not exist, because 'exists' lacks the modal moment. Here, existent $\approx s(E)$. Then, by JCP or HCP, $(\iota x)(xrd \,\&\, xsq \,\&\, xsE)sE$, since ch(sE). But it does not follow that $(\iota x)(xrd \,\&\, xsq \,\&\, sE)E$, i.e. $(\iota x)(xrd \,\&\, xsq \,\&\, xsE)msE$, applying m2, for that would require $msE \approx sE$, that sE has the modal moment - where the *modal moment predicate* is defined; $mm(sE) =_{Df} msE \approx sE$. But $\vdash \sim mm(sE)$, i.e. sE demonstrably lacks the modal moment. For $ch(sE) \,\&\, \sim ch(E)$. So $\sim(E \approx sE)$; and $\sim(msE \approx E)$.

The argument has led to a second role for the modal factor, as a predicate mm. This is certainly a role Meinong assigns to the modal moment, the main role: some features have the modal moment some lack it.[1] What Meinong apparently wants the factor to do is, however, to include *genuineness* of status, to fulfil role (ii).[2] If one *supposes* that an objective has factuality and the factuality carries the modal moment, then the objective is a genuine fact; if one assumes that aE and mm(E) then a genuinely exists. To express this semantical feature, of genuineness of status of properties, a further functor is first required, H say, read 'It is supposed (hypothesized) that'. In terms of H, an important freedom of assumption principle is readily expressed:

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[1] Grossmann (MNG, p.222) speaks of objectives having the modal feature'. This appears at best to be a derivative use, for *certain* objectives. Objectives ascribing factuality can be said to have the modal factor iff the factuality has the modal factor.

[2] (Footnote on next page.)

FAP1. $\Diamond HA$, it is possible that anything at all is supposed.

The principle of genuineness of status can now be stated as follows:

GS. $(a)(mm(f) \,\&\, Haf \supset. \ af)$ [alternatively, it could be used to *define* gs(f)].

But now Findlay's 'second wave' arises to overwhelm Meinong's theory. For suppose Meinong grants, as he appears to have, that *factuality* has the modal moment. Further Findlay assumes $2 + 2 = 5$ has *factuality*, whence $H(2 + 2 = 5)$ has *factuality*. Thus by GS, $2 + 2 = 5$ is a genuine fact, i.e. $2 + 2 = 5$.

Faced with such serious difficulties over assumptions involving the modal moment - for instance the assumption that $2 + 2 = 5$ has factuality with the modal moment, which if defensible would make it *true* thus $2 + 2 = 5$ - Meinong retrieves the situation

> by holding that we *cannot*, by means of a judgement or assumption, attribute the modal moment to an objective that does not possess it (Findlay 63, p.107),

that is, by qualifying the unlimited freedom of assumption principle, FAP1. This retrieval rapidly leads to new difficulties, to Findlay's 'third wave'. The trouble is that we seem to be able to think of, and do, what Meinong has

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[2] (Footnote from previous page.)

To help explain why Meinong seeks such a factor it is not enough to look merely at Meinong's use of the modal moment in meeting difficulties for the theory of objects. It is also important to look at Meinong's theory of factuality (or truth), which would, if successful, afford a simple answer to serious sceptical arguments (cf., but critically, Grossmann MNG, p.222).

Meinong accepts not only the weak existence acquisition thesis, but is tempted by and appears to assert the strong acquisition thesis. Why? The reason seems to be this: there is a marked tendency in Meinong's thought to take the determination of factuality (of being the case, or in non-Meinongian terms, truth) to be an (entirely) *internal* matter, as if objectives carried a sign of their obtaining with them (as they might do if those that obtained were illuminated, the light being the modal factor); to leave out, or rather internalise, semantical factors - especially the critical factor of *relation* to the factual world $\underline{\underline{T}}$ - in favour of internal assessment through (inspection of) objectives. A main objective and main difficulty with the doctrine of a (modal) factor - serving as a semantical factor, indicating how things do stand - is that Meinong tends to convert it too, to an internal evidential feature, something that a suitable status predicate can simply *show* and that can be discerned by contemplation. This is like trying to write the semantics into the syntactical theory and then expecting that the symbolised theory will deliver information about what is in fact true. Neither is on.

said we cannot.

> According to Meinong, we can think or believe that a round square is existent ..., but we can neither think nor believe that it exists. How can Meinong make such a statement without thinking of a round square which exists as of one which is merely existent (63, p.109).

Meinong's "analogical thinking" reply to this objection (in Mög c.p. 283) is entirely unsatisfactory; the best even Findlay can manage to say of it is that it is not 'obviously fallacious', not 'wholly unplausible' (p.110).

There are alternative and much superior ways of retrieving the situation, namely abandoning GS or abandoning the assumption that genuineness-revealing status predicates can be found, or both. GS should certainly be changed, because, as Haf can always be got, it reduces to $mm(f) \supset af$. The latter principle will only hold for necessarily-held predicates or the like, *never* for contingently-held predicates such as 'exists' and 'is a fact'. Assumptions like mm(E) and that *existence* and *factuality* have the modal moments also have to be rejected, unless mm is redefined. For the predicate mm has a role linked with reliability. Indeed $\vdash mm(f) \rightarrow ch(f)$, for every f for which mm is defined. The proof is like that of $\sim mm(sE)$. That is, whatever predicate (and so derivatively, feature) has the modal moment is characterising. Thus contraposing, since $\sim ch(E)$, $\vdash \sim mm(E)$. Similarly ~mm(*factuality*). These results point the way directly out of Meinong's difficulties. The way is not the way of qualifying freedom of assumption principles such as FAP1, not the way of restricting what can be thought about or assumed. Thus the 'third wave' is avoided and therewith and Meinong's unconvincing response to it. The way is of course the way of qualified Characterisation Principles. Findlay can assume that 2 + 2 = 5 has *factuality*. We can consider the objective d that 2 + 2 = 5 has *factuality*. It simply won't follow that d has *factuality*, because 'has *factuality*' is not characterising. Thus the 'second wave' is averted.

The moves were averted, however, without appeal to the modal moment, but through requisite qualifications on Characterisation Postulates. Is there a point in retaining the modal moment(s)? Perhaps, to tidy up connections, e.g. between full and reduced strength predicates. On the other hand, extra and rather unnecessary auxiliaries such as the modal moments are not carried at zero cost, e.g. they complicate the theory and they increase the risk of logical disaster (at least until a relative adequacy proof is given). There is, naturally, no ontological objection to such auxiliaries, so long as they are not assigned unwarranted ontic features, e.g. taken to exist. But in excess in a theory, they are a bit like an excess of drones in a hive: they do not work and they reduce the quantity of honey.

7. *Restrictions on the Characterisation Postulate versus restrictions on freedom of assumption principles*. Very serious for the coherence of Meinong's theory of objects are Meinong's vacillation and ambivalence about

(i) whether, and how, the Characterisation Postulate (in Meinong's principal form A(ιxA), the object has the nuclear features ascribed to it) should be restricted, and

(ii) whether, and how, the freedom of assumption principles should be qualified.

But (i) and (ii) are not entirely separate worries for Meinong, as he tended to conflate the issues (see especially the discussion in Mög, p.276 ff.). As to (ii), the unlimited freedom principle of UA, p.348, which Meinong ascribes to commonsense, is restricted in Mög, p.283 ff., to prohibit assumptions in which the modal moment is present. As to (i), the principle was qualified by Meinong in respect of certain status and theoretical features (see chapter 5). Indeed all the distinctions required for an appropriately quantified and apparently adequate theory were available to Meinong and appear, with more or less precision, in his work. Why then didn't Meinong investigate some of the other options open to him, and so work himself out of the difficulties in which he found himself in Mög and EP? That is a hard, and open, question. But it seems that Meinong, despite the qualifications he from time to time imposed on the CP, was striving for a resolution which placed no restrictions on the CP, and but minimal qualifications on FAP. That way however lies a dead-end. There is no way that avoids sharp, but very natural, qualifications on CP, and given these there is no need to qualify FAP at all.

The theory of items disentangles and sharply separates questions (i) and (ii). It imposes no restriction on freedom of assumption: assumption is absolutely free. Thus $\Diamond$HA, whatever A. But it limits characterisation. In order to reduce difficulties or uncertainties about what shape these restrictions should take, the theory breaks the problem down into easier problems, the problem of appropriate characterisation principles for each logically different sort of item (cf. chapter 5). The question of appropriate restrictions then becomes much more straightforward, several principles being natural and obvious, e.g. Characterisation Postulates for abstract sets and properties as well as for bottom-order objects.

8. Did Meinong sell out? According to Grossmann (74, p.82) Meinong in the end comes close to abandoning the most distinctive thesis of his theory, that the round square really is round and more generally, that nonexistent objects really do have their characterising features. The damaging passage in Meinong's work is given as Mög, p.287-88.[1] But Meinong asserts categorically on p.287 that the round square is round, and on p.286 that the moonlike round square is certainly just as moonlike as it is round and square. That is, there is first rate evidence that Meinong is not abandoning his distinctive thesis. What Meinong does allow is that the judgment that the round square has konsekutive roundness is not analytic and the predicate goes beyond the first occurrence of 'round'. It is evident that Grossmann has travestied the point by assuming that it is only when 'round' occurs in the predicate of such a judgment as konsekutive that the object of which 'round' is predicated is "really round".[2] It is a bit like saying that Routley rejects FCP and doesn't really believe the round square is round because he rejects the claim that the round square is round^E.

Though it should be obvious it probably needs saying that even if Meinong did in the end sell out, that sell-out would not transfer to other different theories of objects. Whether or not Meinong sold out, the theory of items in particular is not being sold up. In fact however Meinong, unlike Mally, did not sell out. The Meinongian opposition has been up to its old tricks of misinterpretation in a further effort to discredit the theory of objects.

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[1] There are also some damaging passages in EP where Meinong seems, at first sight, to be giving away crucial features of the theory of objects (cf. 6.3).

[2] Nick Griffin made this point.

9. Was Meinong committed to a reduction of objects? While Grossmann insinuates without introducing any substantial evidence that Meinong was working with a reduction model, of objects as complexes, i.e. certain sets of properties (e.g. MNG, p.43), Dyche goes further and claims that 'for Meinong objects are not individuals. They are not individuals of any sort at all, whether complex or incomplete (76, p.145); '... Meinong's whole metaphysics is a metaphysics of properties and states of affairs (p.147). According to Dyche (p.viii),

> Meinong's possible and impossible objects are natures, that is they are universal properties or universal complex properties;[1]

but Dyche also states his reduction thesis in various other, sometimes non-equivalent, ways, e.g. 'while individuals are not properties, they are functions of properties; (p.147), 'we can analyse any given individual into a complex of so-being determinations, e.g. into its nature' (p.169).

But the 'straightforward' evidence Dyche assembles for his reduction thesis is extremely tenuous; and, incidentally, he assembles some counter-considerations, e.g.

> Speaking of objects which are natures is a revision of Meinong's own way of expressing himself, since he speaks of the nature which incomplete objects have (p.167).

Dyche says that the evidence begins in Erfgl and becomes most explicit in Mög. Part of Dyche's case is that (bottom order) nonentities are not individuals (individuals he proceeds erroneously in the course of his presentation to equate with existing individuals), and so must be universals. Thus he takes it as an important evidential point that 'Meinong systematically distinguished ... between individuals on the one hand, and possible and impossible objects on the other' (p.146). Unfortunately for this point, the section of Erfgl with which he deals 'does not once use the term "individual"' (p.148). However, Dyche claims, while admitting that his point is 'controversial', that in Mög 'it becomes contextually clear that Individua and Dinge are the same entities' (p.150). The very thin evidence offered for this claim leaves it open, however (p.150), that nonentities are individuals! Moreover the fact that Meinong sometimes distinguishes 'Dinge der Wirklichkeit' does nothing to show that all individuals are actual.

In fact Dyche adduces no direct evidence that Meinong contended that nonentities were not individuals. Instead he switches to examining

> some indications that Meinong either explicitly thought of the objects in question as being properties or that, at a bare minimum, he, consciously or not, tended to think of them in that manner (p.153, initial emphasis added).

All that some of the indications (e.g. p.153 bottom) show is that we might try modelling some of Meinong's theory in the Grossmann-Dyche fashion, all that others of the further 'systematic considerations' reflect (e.g. the questions of p.154) is the fact that there are features of Meinong's theory that are puzzling and not so far well understood. Dyche's 'almost conclusive' argument - that apart from individuals, which he by now proceeds to equate with entities, all objects are attributes or conditions, i.e. are of higher order - is anything but almost conclusive. The obvious construal of the evidence presented, which he mentions, is that the principle in question, LEM, holds not merely of individuals but of higher order objects as well. Dyche's response is feeble: 'For this reading to go through, however, there need to be some appropriate contextual indications which I fail to find in the text at that point' (p.156).

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[1] Thus too, as on Grossmann's model, instantiation usually reduces to inclusion: the round square is round because roundness is part of the complex <Round, Square> (MNG, p.167); 'to say that Pegasus is winged and equine is to say that the complex (and uninstantiated) property (or nature) which Pegasus is implies its constituent parts, among which being winged and being equine are to be found' (Dyche, pp.168-69), but 'it is not true that Pegasus instantiates the property of being winged' (p.169)!

Dyche tries to argue a little more directly that incomplete objects such as "something blue" do reduce to properties on Meinong's theory: 'whether Meinong explicitly recognizes this or not, he in fact collapses 'something blue' into the property blue' (p.160). Again the evidence is simply not there in Meinong's remarks (Mög, pp.170-71); and the objects are quite obviously different. (Dyche's points depend in part on confusing, what are also distinct, the Blue (das Blau) with blue (Blau) and the property blueness.) The fact that Blau and Schwer are universals does nothing 'to show that irrealia are both universals and (complications of) properties' (p.162). With that non-sequitur Dyche completes his case.

It is evident that Dyche's case is no case. There is, it seems, no substantial evidence (else proponents of the reduction like Dyche and Grossmann would have found it?) that Meinong's theory of objects reduces; and there is in fact a good deal of counterevidence, which is not merely circumstantial. Now two important things emerge. Two classes of representation of Meinong's theory are misrepresentations.

Firstly, the attempt to represent, or claim, Meinong as an ontologist, as a metaphysician who could easily take an honourable place in an American midwestern school, such as the Bergmannian school,[1] fails and fails badly. For Meinong's work[2] involves a paradigm shift (as Parsons 78 observes), which shifts it right outside the Anglo-American setting of ontology and the set midwestern positions of the nominalism-realism game. Had the Grossmann-Dyche reduction succeeded it would put Meinong right back in the game. For the main sought corollary of the reduction is of course referential: Meinong's

> metaphysical assay of the constituents of reality does not open the door to nonactual, e.g. possible and impossible, individuals. ... possible and impossible objects ... are real entities ..., in our representation of Meinong, ... properties and complications of properties (p.164).

Secondly, recent attempts to reconstruct (parts of) Meinong's theory of objects with objects identified with sets or set-theoretical functions of properties or the like are - whatever their adequacy to the facts about nonentities - inadequate to the data from Meinong's work. This includes theories of the new Lockeans (discussed in §4 below). While such representations can valuably serve as unintended models for a more formal explication of Meinong's theory, useful (as in Parsons 78) for establishing such results as relative consistency, they do not reflect at all faithfully Meinong's theory.

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[1] This is a not unfair caricature of the approach taken in Grossmann's MNG: see especially the first few pages. It is also the approach of many other theses and papers on Meinong, e.g. Dyche 76, Gram 70, and Bergmann himself.

[2] That of the flawed hero, considered earlier.

10. The bounds of objecthood: paradoxical and contradictory objects. Meinong's theory includes objects of a rich variety of sorts, with many of these sorts - in particular that of bottom order nonentities - irreducible. How far does objecthood extend: what are its bounds, if any? More down to earth and exactly, are there any "things" we can talk and think about that are not objects? By the general principles of the theory, where any such thing is an object, any target of thought or talk is an object, there should not be any such exceptions.[1] Any consistent theory is bound to make exceptions in one way or another - on pain of inconsistency otherwise, e.g. if a contradictory object is an object that contradicts the theorem that no objects are contradictory. That is one of the reasons for proceeding to a paraconsistent theory.[2] Meinong's theory appeared similarly to admit exceptions, for defective objects.[3]

Meinong did not really know, so it seemed to emerge in chapter 5, what to say about paradoxical, or defective, objects. But he seemed to come down in favour of a consistent theory, with defective objects either to be reduced in properties to fit into such a theory or to be ruled out as objects. By contrast, the really exciting theory of items, on which somewhat heavier bets are placed in this text, is the paraconsistent theory in which paradoxical objects are accounted full values of variables. But of course, as is quite legitimate, bets are placed both ways, on both sorts of theories of objects, paraconsistent and consistent, as against rival theories, such as referential ones.

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[1] The thesis, part of M1, that everything is an object is intended to say as much, but it is only as general as the quantifiers used in formulating it. If these are sufficiently restricted even a theory as narrow as Quine's can satisfy the thesis. Hence the point in M1 of specifying various classes of objects.

[2] Again however there are limitations, though now artificial ones, e.g. theory-trivialising objects. As to absurd objects - which can be included unproblematically upon significancizing the theory - see Slog, chapter 7. Of course all these objects are objects of thought and quantification: they simply will not have their damaging features whichever they are. (A consistent theory can say the same.) No good theory will have a trivialising object that truly says of itself that it is trivialising. Here lie the "limits" of paraconsistency. The limits appear however undisturbing. For, in contrast to the paradoxical statements that Gödel, or at least Rosser, mapped into formal arithmetic, it seems that damaging systemic conditions are not going to be forthcoming as regards parallel mappings of statements concerning trivialising objects.

[3] Meinong was continually bothered by the question as to whether anything contrasted with objecthood, with Aussersein. The fact of the matter is that there are perfectly good notions which have no contrast.

Meinong's theory of objects, despite its unfortunate commitment to kinds of being, and other unpalatable doctrines, is not referential, so it has been contended. It contains however far too many referential elements, which the theory of items properly removes. Some of these referential aspects are now alluded to briefly.

11. Identity and essentialism. A central feature of the theory of items is the thoroughgoing rejection of the Reference Theory, not merely its existence requirements (as incorporated in the Ontological Assumption) but its identity requirements (as embodied in the Indiscernibility Assumption).[1] The rejection of the latter is especially important in obtaining a satisfactory treatment of intensionality. It is primarily through its identity theory, furthermore, that the theory of items avoids essentialism of damaging kinds. (The other main way, not all of it systematically elaborated, is through use of indeterminacy and of, what amounts to, fuzzy or partially indeterminate sets.)

Meinong however, nowhere gets to grips with the modern problems concerning identity (which is unsurprising, since, though they were known to Meinong's contemporary, Frege, these problems only become severe with the ascendancy of classical logical theory). Nor, more important, does he work out a non-referential theory of identity and thereby dispose of the second main facet of the Reference Theory. Nor does he escape essentialism. There is in fact no clearly worked out theory of identity in Meinong. The lack of a suitable nonreferential identity theory may help to account for his failure to see through various of the sceptical arguments, e.g. those considered in 8.10 which exploit identity features, and thus indirectly for his failure to eliminate the usual middlemen introduced in trying to meet sceptical arguments.

12. The excess of intermediaries. Meinong does not use the theory of objects to advantage to eliminate parasitic middlemen from his philosophical system. On the contrary, his system is very complex and stuffed with more intermediary and auxiliary objects than the theories of the empiricists and theories that accept the doctrine of ideas - with an enormous bureaucracy of middlemen. Yet the theory of objects enables one to dispense with almost all these objects - epicyclic objects discerned by philosophers to prop up faulty referential theories and to prevent their straightforward falsifiability, and increase their untestability. The points are readily illustrated; and examples are instructive in revealing the differences in orientation and direction between Meinong's theory of objects and the theory of items.

Although Meinong adhered to a simple designational account of meaning, according to which the meaning of every noun phrase or sentence is an object (UA, p.25, 60),[2] his theory of designation (or reference, as it is commonly called) adds a further auxiliary object. The point of introducing this auxiliary object as well as the object designated (or target or ultimate object) is to resolve the incompleteness argument (studied in 8.8). The argument Meinong relies upon is (Mög, p.181 ff.) basically this: the objects we signify are sometimes complete and hence infinitely complex. Since we cannot mentally apprehend this infinite complexity, how do we ever manage to signify such complete targets? The conclusion Meinong draws is that there have to be appropriate auxiliary objects. These intermediaries are incomplete objects; and it is through these incomplete objects embedded in complete objects that complete objects are given to our thought. The argument resembles the incompleteness argument already examined: it is similarly based on a faulty identity notion and similarly invalid. Given suitable identity and other relations, such middlemen can be paid off. Meinong's penchant for intermediate objects does not stop there: he can find a place for a further intermediary between the intermediary object and the complete objects. As Findlay, expounding the theory, remarks (63, p.179), it 'raises formidable difficulties'. These difficulties infect Meinong's whole theory of perception.

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[1] These follow (with but few further principles) from the RT in the form that truth is entirely a function of reference.

[2] An account derived in 1.24. Thus the theory satisfies Meinong's important requirement that every subject signifies an object. (Parsons 78 violates this requirement.)

The theory of content, which pervades much of Meinong's work, affords a further example. Meinong, following Twardowski, adopts a three term theory of presentation, of the relation between experience and object presented or selected. In every experience, as well as an act or experience-moment and an object experienced or indicated, a further term, a content was said to be required to explain how an experience can point beyond itself, to direct the act towards its object. Hence the thesis (which was intended to apply to "experience" construed broadly, e.g., to thinking, judging, assuming):

> TC. Every experience-act is directed, by a content, towards a target, its object.

The theory encounters very many of the problems of the parallel, but different, theories of sense data and ideas, and more, e.g. it is difficult, if not impossible, to discern contents (for some elaboration see Findlay 63, chapter 1). Freed from the pull of referential arguments, contents, like sense data, can be dispensed with theoretically, and TC contracted to the simpler thesis that every experience has an object. As for direction, an experience can simply be about an object.

13. Referential considerations at work elsewhere in Meinong's philosophy. Meinong had, his philosophical development reveals, a considerable struggle freeing himself from residual forms of the Ontological Assumption, that whatever is thought of, contemplated, or otherwise has properties, has some kind of being. Even when he did break free of the Reference Theory, with the doctrine of Aussersein and rejection of Quasisein, he did not entirely resist the referential temptation to slide back into accounting Aussersein a further way of being and ascribing a kind of being (minimal-existence) to nonentities. But although Meinong did manage to break free of the Reference Theory in his main published work on the theory of objects, he did not succeed elsewhere in his philosophy; or rather he did not apply the hard-won results from the theory of objects elsewhere, to remove referential considerations or referentially-motivated intermediaries. Thus, for example, he did not observe, in the sharp way Reid had, the theories of ideas at work in philosophy, or the damage it wreaked.

It is worthwhile trying to bring out how some of Meinong's doctrines only more loosely connected with the theory of objects have been adversely affected by referential considerations. But the attempt is perforce a very limited one. For Meinong's philosophical position is vast in its spread - though not entirely comprehensive, for there is no political and little social theory - and it is elaborate,[1] in part because of the excessive wealth of intermediaries. Some cases of referential considerations at work will have to suffice. One case, the theory of act, content and object,[2] has already been considered (in this section) and another case, the theory of values, has been alluded to (in chapter 1). The basic notion of value theory, according to Meinong is value feeling. But Meinong's theory of values is distorted throughout by the assumption

> that value-feelings are all cases of concern with existence or nonexistence. It is never mere objects or properties of objects that have value, but always the fact that there are, or are not, such objects (Findlay 68, p.268).

The assumption, which runs quite counter to commonsense, appears to be based on Brentano's thesis that all judgments are judgments (affirmative and negative) of existence, a thesis that is a direct product of the Reference Theory in combination with traditional logic (for according to traditional logic all judgments can be represented syllogistically and these forms can be reduced to I and O forms, which, given the RT, are always either affirmations or denials of existence).

By contrast the theory of items removes part of the usual reductionist reasons for trying to confine value judgments to such set canonical forms, e.g. reasons such as worries about nonexistence, intensional objects and non-natural properties. In contrast to canonical form positions like Brentano's, the theory of items tolerates, and sometimes welcomes, a richness in logical and expressive forms. While various different theories of value can be coupled with the theory of items, the theory when followed through tends to lead to a theory of values[3] very different from Meinong's. Such an alternative theory will not doubt include suitably neutralised versions of some of what Meinong calls dignitatives (roughly, primary axiological universals, such as the Good and the Beautiful) and perhaps also of desiderata (primary deontic universals). But contrary to Meinong, such objects do not have being, of any sort (for reasons given in chapter 9); nor do Meinong's (a priori and quasi-empirical) arguments, which turn on versions of the Ontological Assumption, show that they do.

Although Meinong's theory has its referential troubles, these are modest compared with those of modern referential theories, and some of the troubles are easily rectified. Meinong's theory is then a superior basis on which to try to build a satisfactory theory than the more illustrious modern referential alternatives we are usually offered.

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[1] Naturally and predictably then, there are many things in Meinong's philosophy, some of them elaborations of the theory of objects to fill it out or to meet objections, others of them only more loosely connected with the theory of objects, that have not been considered in this very preliminary account.

[2] While there is a fair measure of truth in the claim that 'the theory of objects, as Meinong presents it, is firmly entrenched in the act-content-object analysis of psychological experiences' (Rapaport 78, p.154), the theory of objects can be presented in a way that is largely independent of that analysis.

[3] For details of such a theory see ENP.

§3. *The failure of modern direct reductions of nonentities to surrogate objects.* Despite the small new wave of enthusiasm for nonexistent objects, the overall record of post-war philosophy is little better than that of earlier philosophy. The prevailing theories are referential and the prevailing moods are accordingly platonistic or, more commonly, reductionistic. Thus, for example, some who have been represented in the literature as Meinongians are not, but hold platonistic positions. One example is Chisholm, whose recent work, considered shortly, is overtly platonistic, indeed, as Chisholm himself says, 'presupposes an extreme version of Platonism' (76, p.119). Another very different example is D. Lewis, whose platonistic work is represented as relentlessly Meinongian in Lycan 78. Yet other examples are the new Lockeans, Castañeda and Grossmann (see §4 below); again they are but doubtfully and controversially accounted Meinongian.

But where serious attempts are made to take account of nonexistent objects, the attempts are usually reductionistic in part at least (thus all the referential platonistic positions). Invariably these are reductions of nonexistent objects to what are taken to be entities, sometimes they are reductions to what are taken to be intensional entities. The usual attempts, which comprise reductions to the following enumerated kinds of objects, may be classified thus:

A. Reductions to the nonabstract, to

(1) Linguistic objects. In crudest form, God is a mere word, 'God' (a flatus vocis, in the transposed terms of medieval nominalism). The inadequacy of the crude view is apparent from translation objections; e.g. 'God' and 'Deus' both signify the same object, but the names are distinct, so the object can coincide with neither name. Meeting the translation objections usually leads to an abstract reformulation of the view, e.g. objects are sets of synonymous (or equivalent) words, again plainly inadequate. Practically all the standard objections to attempts to construe propositions as collections of sentences and worlds as collections of sentences, apply against attempts to reduce nonentities to linguistic objects or collections of them, e.g. there are insufficiently many sets of words, the specification of the correct sets of words involves a circular appeal to the object to be specified, etc.

(2) Mental objects, such as ideas, concepts (in one sense), e.g. Pegasus is the idea of Pegasus. Both Reid, in his elaborate refutation of the Theory of Ideas, and Meinong (cf. chapter 3) made telling criticisms of such reductions. And once again ideas, especially if they comprise only actually had ideas, are insufficient in number to accomplish such a reduction.

The best hope for retaining reductions of this sort, to the nonabstract, is to replace them by contextual definitions, of statements apparently about nonentities by statements about entities, e.g. in the style of Russell's theory of descriptions. But such paraphrases are also (as we have seen in chapters 1 and 8) inadequate, if less conspicuously so than direct reductions.

B. Reductions to the abstract, to

(3) States-of-affairs.

(4) Propositions. Attempts (3) and (4), which are occasionally separated, are commonly assimilated. Certainly the proposals to reduce

propositions to states-of-affairs (e.g. Meinong, Chisholm 76) and, conversely, states-of-affairs to propositions (e.g. Russell) are commonplace; and the line between them has been too fine for many philosophers to discern. Yet the linguistic forms are clearly distinct, and there are important functors which can take one form but not others. Examples help make both points clearer.

Propositions	State-of-affairs	Featurestances
That the city is ugly.	The city's being ugly.	The ugliness of the city.
That Illich is happy.	Illich('s) being happy.	The happiness of Illich
That all holes are black.	The being black of all holes.	The blackness of all holes.

Generally

That A, where A is a declarative sentence.	Transformations of A's being so; notably, where A is of the form S is P, S('s) being P or the being P of S.	Where A is the form S is P, the P-ness of S.

The method of functorial separation separates the objects. Functors of the order of 'a believes' (e.g. 'a conjectures', also 'a hopes') can collect propositional expressions but not state-of-affairs and circumstance expressions; consider e.g. 'a believes the being black of the hole', 'a believes the blackness of the hole'. For the converse separation consider, e.g., 'a studied'. The functor 'a knew' separates all three classes; for 'a knew that the city was ugly' means something rather different from (and does not entail) 'a knew the ugliness of the city', while 'a knew the city's being ugly' is usually rejected as ungrammatical. What, for want of a better term, are called 'featurestances' may be separated by functors such as 'the revolutionary council remedied' which couples satisfactorily with 'the ugliness of the city', but not grammatically with 'that the city is ugly' and at best curiously with 'the city's being ugly'. Finally consider such separating predicates as 'is true', 'obtains', 'ended'. Naturally many functors apply to all three classes, e.g. 'what Egberta is thinking about is', 'that which Ramsey fears is'.

Because of the separation the orthodox assumption that three different classes of objects (and others) can be satisfactorily reduced to one fails: reductions will serve for limited purposes only. A corollary is the failure of a basic premiss, identifying the classes, in Chisholm's ontological reduction 76 (a reduction that fails also on several points of detail).

How do any of these sorts of objects help in a general reduction of nonexistent objects? It is clear enough how they are supposed to help in accounting for all objects of certain sorts, e.g. for all those circumstances of classes (3) and (4), and perhaps also for such items as events (cf. Chisholm's case). But what of objects such as Pegasus? One approach has been that such terms as 'Pegasus' and 'the round square' only occur within circumstantial expressions (e.g. statements), and hence their occurrence is already accounted for. This is essentially a free logic approach and inadequate for the same reasons as free logics, namely that there is much true discourse that they fail to account for satisfactorily (cf. 1.8). Another approach has been by way of possible worlds. Possible worlds are characterised in terms of, for instance, states of affairs, and then an attempt is made to account for nonentities by way of possible worlds, for instance as individual concepts which are explained through functions which assign an individual at each possible world. (The procedure thus amounts to a semantical analogue of theory of description procedures.) The procedure is a slight improvement on methods which simply assign a null entity, e.g. to 'Pegasus'. For example, it can account for the truth of 'it is possible that Pegasus is winged'; in some possible world 'Pegasus' is assigned, say, the cock Balthazar. But really each link in the attempt to so account for nonentities is weak. Firstly, the description of a state-of-affairs does not give a possible world in the usual sense of complete-consistent world. Rather many states-of-affairs have to be consistently combined; in this sense a possible world can be represented by a maximal consistent set of states-of-affairs. But with sets at hand and functions also required, a more direct approach to the problem of accounting for nonentities can be had. Secondly, the framework is too narrow to account for impossible objects. Thirdly, the attempt to treat nonexistent objects as individual concepts on the theory not only makes them all existent but inevitably leads to the assignment of the wrong truth-values to many statements about them.

(5) Sets, and compositions of sets.

(6) Properties, and sets of properties and complexes of properties. Attempts (5) and (6) differ (or at least appear to differ - for functional analyses of properties by way of sets at possible worlds may make the difference vanish) in the extent to which intensionality is pumped into the analyses. The attempts are modern objectified descendents of Locke's attempt to account for mythical objects through combination of ideas. Most modern attempts to reconstruct parts of Meinong's theory of objects or something like it fall into these classes, which call for more detailed discussion (see §4 below).

(7) Natures, and individual universals. There are two suggestions to consider: firstly, that nonentities are nothing other than natures or essences, and, secondly, that Meinong's nonexistent objects were really natures (a thesis of Dyche 76). While it is true that nonexistent particulars have a good deal in common with (nonexistent) universals, especially universals singled out by 'the' as essences or forms can be, nonetheless there are important differences. Pegasus is a particular, and differs from both the Horse and the Winged Horse, neither of which is a particular (though both are singular objects). Pegasus is in principle only one among many different winged horses, and not all of these can be identified with the Winged Horse, or they would be the same and not different. Furthermore, Pegasus has many properties the Winged Horse does not have, e.g. he was born, he sprang from the blood of Medusa, he raised the fountain called Hippocrene. Conversely, the Winged Horse is exemplified in particular winged horses such as Pegasus, but Pegasus is not (significantly) so exemplified.

Though the emphasis in what follows will be on reduction attempts of classes (5) and (6), many of the points to be made are more general. All the reductions fail for the same obvious reason: they assign to nonentities properties they do not have, most conspicuously existence. For instance, if a nonentity is a set, or a complex or whatever, and sets (or the sets of sets in question) exist, then the nonentity exists, by the transparency of 'exists', contradicting the nonexistence of the nonentity. Again, a way out through a distinction of types of existence may be attempted, e.g. nonentities do not have concrete existence but have set-theoretical, or abstract existence: but this is an approach that has already been rejected. A more appealing resolution (for noneism) is simply to say that sets - to continue with this example - do not exist: but to say this is to destroy the usual point of the reduction exercise (which, linguistically viewed, is to reform all discourse which strays from preconceived referential norms). For nonentities are no longer constructions from things that do somehow (manage to) exist; "ontological reduction" is no longer effected. As conceptual exercises however such reductions may still be of interest, just as such logistic reductions as those of natural numbers to certain sets and real numbers to certain other sets are of much interest even after it is made clear that none of the objects in question exist. Can nonentities be reduced, then, to nonexistent sets? Again, the answer is No, not preserving requisite properties. For consider Pegasus. Either Pegasus is identified with a nonnull set, a say, or he is identified with a (the) null set Λ. Since a is nonnull, for some b, b is a member of a, whence since (on the first alternative) Pegasus = a, b is a member of Pegasus. But this is not true (it is either false or nonsignificant), for Pegasus has (sensibly) no members. If however (on the second alternative) Pegasus is identified with Λ there are equally severe problems. For one thing, Pegasus is assigned many features he does not have, such as being a subset of every set, having Λ as a subset, and so forth; for another, Pegasus gets identified with other (eventually, upon reconsidering the first alternative, all other) nonentities. Hence the proposed neutral reduction fails; for the putative identity fails to preserve even extensional (set-theoretical) properties. This does not imply that there are no connections of interest that hold between nonentities and sets (or bundles) of certain sorts - much, again, as the failure of set-theoretical reductions of natural numbers, for parallel reasons, does not imply that there are not important connections between natural numbers and certain sets. In each case there is an isomorphism, a similarity in structure; specifically, a one-one function which preserves certain properties (relations and operations), those of a given preassigned sort. For example, in the case of the set-theoretic "reduction" of natural number there is a 1-1 function h under which all the usual arithmetic operations, most importantly addition and multiplication, are preserved; specifically where o is a two-place infixed operation on numbers and o' = h(o) is its image (defined) on certain sets, nom = h(n) o' h(m), where h(n) is the set-theoretic image under h of number n. (Similarly, since h is 1-1, in the other direction, from sets to numbers.) But such isomorphisms do not furnish reductions, because they preserve only limited classes of properties; enough for similarity but not sufficient for identity.

The isomorphism between cardinal numbers and sets of equipollent sets is especially striking (and preserves an extensive class of properties) because at the back of it there is a genuine identity, namely an identity of cardinal numbers with properties of certain manifolds. In these terms the striking isomorphism between cardinal numbers and sets is induced (primarily) by another prominent isomorphism, that between properties and sets, or, more generally, between relations and relations-in-extension. (One important difference, not the only difference, between properties and abstract sets lies of course in their identity conditions, which in turn guarantee different interchangability features.) Is there a parallel identity at the back of the rather less striking, but still useful (as Parsons 74 has shown), isomorphism between nonentities and set-or-property-theoretic constructions? No, no non-trivial one it seems. Certainly the obvious parallel breaks down. Nonentities can no more be identified with properties of certain sorts than they can with sets or aggregates (or, in this sense, bundles)[1] of certain sorts; e.g. properties are instantiated, nonentities such as Pegasus are not (significantly).[2] Can the argument be generalised?

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[1] In the literal sense, where a bundle is a 'collection of things fastened together' (OED), many nonentities, like many entities, are not bundles: Pegasus is no more a bundle than an actual horse. In the intended non-literal senses, bundle theories of objects oscillate between the false and the rather trivial. It is trivial that the object a is identical with the object a with a's properties, and so with something with a's properties. But remove 'the object a' from the right-hand side of the identity and replace it - for a subject is required - by what the bundle metaphor suggests, 'a collection', 'a set' or the like, and the upshot is falsity. More problematic are the substance and bare particular transformation of bundle theories, where the 'something' is replaced by 'undifferentiated substance' or 'a bare particular' ('an individual substance' raises no such problem, for that substance can simply be equated with a). The picture is the traditional one where all a's properties have been peeled off (more accurately, abstracted from) a, and only "bare undifferentiated particularity" or the "nonspecific object notion" remain. It is not difficult to represent the picture formally; the object operator is like the set operator $\{- : \quad \}$, which gives, so to say, the set notion without specifying any particular set. What is required is an object operator which takes a collection, or set, of properties into an object, say $I\{ \quad \}$. For instance, $I\{f, g, h\}$ is the object with properties f, g and h; $I\{f : A(f)\}$ is the object with all properties satisfying condition A( ). That is, at least where $\{f : A(f)\}$ is a set of properties, $I\{f : A(f)\}$ is a well formed term. What the logic of I is is another, and difficult, if familiar matter. For to allow $(I\{f : A(f)\})f$ for every f such that A(f) would simply be to reinstate an unqualified CP. $(I\{f : A(f)\})f$ presumably only holds for such f as are consequences of characterising f' such that A(f'). Such necessary restrictions remove the straightforward identity that could otherwise be made between each object a and $I\{f : f$ is a property of $a\}$ i.e. $I\{f : af\}$. The connection can however be made good under certain assumptions, specifically the tempting

ST. Every extensional property is determined by (extensional) characterising properties. (Supervenience thesis).

Let g be an arbitrary characterising property of a. Then ag and also by CP, $I\{f : af\}g$. Let h be any characterising property a does not have. Then ~ah and, by HCP, $\sim I\{f : af\}h$. Hence for all (extensional) characterising properties g, $ag \equiv I\{f : af\}g$. Hence, by ST, the formal equivalence extends to all extensional properties, and so extensional identity follows, i.e. $a = I\{f : af\}$. If such an identity gives what is right in the view of objects as bundles of properties adhering in bare particulars (the bundle $\{f : af\}$ objectified by the nonspecific glue I), the view offers no reduction, only a different perspective on objects.

Note that ST also justifies the identity principle, that if objects coincide on all characterising features, they are extensionally identical.

[2] It is for this sort of reason that Quine's identification, in ML, of individuals with their singletons, convenient as it might be, is wrong. Socrates does not have members, and is certainly not himself an element.

Any identity that will serve for reduction purposes must be an identity of nonentities - either with concrete entities - an option that can be ruled out immediately, since the nonentities would really exist in the ordinary way[1] - or with abstract entities. It is more than an accidental fact that all the suggested reductions of nonentities turn out to be reductions to abstractions of one sort or another (to objects of higher order). Prima facie no such reduction is likely; for abstractions are abstract objects and have the features that belong therewith, whereas bottom order nonentities are not and have the same sorts of properties as concrete entities. For example, Pegasus is a horse, but no such abstractions as states-of-affairs, propositions, properties or sets are, or can significantly be, horses. Only natures, it would seem, might have such properties: the Horse is a horse. However any direct identification of particular horses, such as Black Beauty or Thunderhead, with the Horse would obviously be mistaken.

On general grounds, then, no sweeping reductions of nonentities to entities or to higher order objects are to be expected. The irreducibility thesis gets further confirmation from the many attempts to provide reductions of nonentities to such things, all of which appear to fail.

§4. *The new Lockeanism: theories of Castañeda, Parsons and others.* Modern empiricism (from Bentham and Mill on) has relied primarily upon theories of paraphrase and descriptions to reduce what discourse about nonexistence it permits to approved discourse about what does exist. The approach of traditional empiricism was different. Reductions were accomplished through the pervasive theory of ideas (criticised in §1). Such nonexistent objects as were tolerated (and these varied with the theory), were constructions from the basic building blocks, ideas.[2] Now that the shortcomings of the modern approach are becoming increasingly evident, there has been what amounts to a revival of the traditional approach. What amounts to - for it has not been seen as a revival and it is a revival with significant differences, e.g. the psychologism of the theory of ideas is removed in favour of constructions from aseptic properties or from other abstract entities.

1. Locke's representation of objects in terms of complex ideas. The new Lockeans are those who try to represent nonexistent objects in terms of set-theoretical constructions of properties, or to reduce them to such. The theories of Castañeda 74, Rapaport 78 and Parsons 74 are all of this sort; so is Grossmann's representation of Meinong's theory (MNG, pp.42, 119, 167), a blatantly reductionist representation. In order to show how very similar the models of the new Lockeans are to Locke's picture, it is best to assemble salient features of Locke's view. It is worth noting first, however, that Locke's combination-of-ideas theory did not have any great originality. The theory of ideas, developed by the Cartesians, was, in many ways, a continuation of the Scholastic doctrine of species. It is convenient to consider Locke's version of the theory because it is comparatively clear and easily accessible, because it removes entirely the innate ideas of Descartes, and because, unlike Hume's theory for instance, it imposes no possibility restriction on combinations of ideas. According to Hume,

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[1] In any case, Pegasus is not a word or an idea but a winged horse.

[2] An advanced Lego set provides a partial physical representation of the construction method of the theory of ideas. Out of basic building blocks, simple ideas, an enormous variety of complex ideas (sometimes equated with objects) can be built.

> 'Tis an established maxim in metaphysics, That whatever the mind [clearly] conceives includes the idea of possible existence, or in other words, that nothing we imagine is absolutely impossible. We can form the idea of a golden mountain, and from thence conclude that such a mountain may actually exist. We can form no idea of a mountain without a valley, and therefore regard it as impossible (188, p.32).[1]

Hume applies his principle in a ruthless, and completely invalid, way to show the freedom from contradiction of whatever we have an idea of (one example immediately follows the passage quoted). It would be all too easy to give a Humean proof the consistency of arithmetic (entirely within the framework of his Treatise) and of analysis and set theory. But such proofs would, and should, carry no weight.

On Locke's theory nothing prevents the formation of the complex idea of a mountain without a valley; it is obtained merely by combining the simple ideas that go to making up the idea of a mountain with those that make up the idea of lacking a valley. Similarly for complex ideas of other impossible objects. In fact, Hume's example is ill-chosen, the object is not impossible: imagine a planet that is perfectly spherical except for just one mountain. Granted we can form ideas of inconsistent objects by Lockean principles (this is a matter of the logic of complex ideas), can we imagine the objects? Though Locke has reservations about the imaginability of such objects, there need be no reservation. For many humans can imagine, indeed can visualise (as Escher's work helps show), impossible objects. Their conception of those objects does not imply the existence, or, what is different, possible existence of the objects. To assume so is tantamount to reading in a possibility version of the Ontological Assumption, that whatever true discourse is about must possibly exist, i.e. must be such that it could exist. Such an assumption is seriously mistaken.

Ideas, according to Locke (and according to many following him, e.g. Hume), divide into simple and complex 'All complex ideas are made ... [by] combining several simple ideas into one compound one' (Locke 75, p.163). For example, the idea of Swan

> is white Colour, long Neck, red Beak, black Legs, and whole Feet, and all these of a certain size, with a power of swimming in the Water, and making a certain kind of Noise ... (p.305),

while the idea of God is a

> complex one of Existence, Knowledge, Power, Happiness, etc., infinite and eternal (p.315).

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[1] In later formulations of this 'evident principle' (e.g. p.250) and in the version Reid quotes, and criticises (1895, p.377 ff.), the word 'clearly' is omitted. Evidently a redefinition of 'clearly' could be pressed into service to render the (first) maxim analytic - whatever conception did not entail possible existence would be dismissed as "confused" - but then (1) the maxim is not equivalent to the second maxim restricting imagination and (2) Hume's applications of the principle require much further ado and more argument than Hume offers, i.e. he has to show not only, what he claims, that we have an idea, but that it is clear.

(The hopelessness of these particular explications as conceptual analyses is transparent.)

The modern Lockean conception of objects as represented by classes of properties coincides with Locke's representation in terms of complex ideas. For the combinations are class combinations, and the simple ideas involved are properties or concepts, mentally construed. As to the first, Locke writes of 'complex ideas being made up of collections' (e.g. p.368). As to the second, consider, to begin, Locke's examples of simple ideas: his initial list of ideas (p.104) includes just these simple properties: whiteness, hardness, sweetness, thinking. More generally, simple ideas are either ideas of sensation, which are simple *qualities* conveyed by the senses, or ideas of reflection, which are concepts furnished by such operations of reflection as thinking, doubting, believing, reasoning, willing. As to representation of objects, consider Locke's division of ideas into real and fantastical (p.372 ff.). The important cases for comparison of the old and the new are the complex ideas of substances (p.374) where real ideas are 'such as have a conformity with the ... Existence of Things' (p.372); more explicitly,

> our *complex* Ideas of *substances* being made all of them in reference to Things existing without us, and intended to be *Representative* of Substances, as they really are, are no further *real*, than as they are such combinations of simple *Ideas*, as are really united, and coexist in Things without us. (p.374, my wavy italics).

i.e. real complexes represent entities (the representative account of perception is a special case). The contrast is with *fantastic* ideas,

> which are made up of such *Collections* of simple *Ideas*, as were really never united, never were found together in any substance; v.g. a rational Creature, consisting of a Horse's Head, joined to a body of humane shape, or such as the *Centaurs* are described ... such Collections of *Ideas*, as no substance ever showed us united together, ... ought to pass with us for barely imaginary (p.374, my wavy italics)

Some of the fundamental classifications of objects, but made with respect to substances, can be glimpsed also in Locke. For instance, inconsistency of an imaginary substance is allowed for though inconsistency or contradiction of the components of the corresponding collection. Incompleteness is also considered (p.365).

Locke tries to take his theory much further than modern cautious counterparts have dared to venture, to include for example a range of higher order objects, also complex and collective objects. To establish his empiricist thesis (p.104) Locke has, strictly, to consider *all* objects with which knowledge may be concerned. This he never does in a systematic way: thus he does not establish the thesis of conceptual empiricism. Indeed since that thesis is false (cf. chapter 9), the theory is bound to fall short.

Not only is the theory incomplete: its consistency is in serious doubt. The reason is that Locke is open to the two main objections Russell made to Meinong's theory, inconsistency and novel ontological proof: for objects appear to have the properties given in their representing class of ideas, e.g. God does exist, is powerful, etc. Consider, e.g. the complex of ideas that yields the existing 10,000 m mountain in Ireland. Ireland has no such mountain.

2. The new representations of objects in terms of sets of properties. The new theories attempt to place, or reflect, theories like Meinong's theory of objects, and to account for nonentities, within a fairly standard classical referential framework, within the framework of an enlarged "empiricism" (with sets, properties, etc.). Where the theories differ from Locke's is in having much more technical apparatus than that of the theories of ideas, with which to carry through the enterprise. What the new theories have in common is, in the first place, an ontology of properties and sets. Properties exist, all of them, according to Castañeda and Parsons 74. In fact in Castañeda 74 they are (much as ideas are for Berkeley) the main constituents of the world; and it is from sets or complexes of these entities that objects are composed - at least that is the working model, even in Parsons' theory of 74. Since (in the second place) nonexistent objects are or are represented by sets of properties, i.e. are set-theoretic functions of certain sets of properties, they all exist. (Parsons regularly quantifies over them using the 'existential quantifier', regularly applies what he calls 'existential generalisation', etc.) For example, the round square exists because the set of properties {roundness, squareness} exists. Admittedly the theories do not assign to impossibilia individual existence (which is as well for their consistency). The objects that really do exist are assigned a special status among the existents; in this respect the theories are like the realism of D. Lewis according to which all possible objects exist but some (those that do sometime-exist) are distinguished as actual.

The theories are accordingly platonistic kinds-of-existence theories. The theories thus diverge fundamentally from Meinong's theory of bottom order objects, and from the theory of items advanced, according to which nonexistent objects do not exist, and indeed in general have no kind of being. Parsons tries to minimize these differences by saying that he is using 'exist' to mean 'exist or subsist' in Meinong's sense. According to Meinong however, many objects neither exist nor subsist: whereas Parsons' analogues of these objects exist. The divergence from the theory of items is still greater; for not only are sets and properties among nonentities, but on it no nonentities subsist, so sets and properties neither exist nor subsist. But on any theory that rightly holds that sets or properties do not exist, the objects the new theories supply as entities, e.g. {$\underline{f}$: (Kripke)$\underline{f}$} for Kripke, do not exist! Nor, as we have seen, are the differences between a theory which talks neutrally about properties and one which holds they exist, trivial or merely terminological - any more than the differences between parallel theories about impossibilities or theories about minds or ghosts. Moreover, according to the theory of items (as for Meinong's later theory) there is only one way of existing, that in space. But {$\underline{f}$: (Kripke)$\underline{f}$}, unlike Kripke, does not exist in space.

The reductions mistakenly assign to nonentities not just existence but the wrong categorial features. For "entities" are, as on Kripke's theory of fictions, abstract entities; and similar objections may be lodged. Thus it is true on each of the theories that Pegasus is a set, has elements, is a subset of the universal set, and so on, though none of these things are true of Pegasus (cf. the criticism of Parsons 74 in 8.3).

Since the new theories frequently assign the wrong categorial features and wrong status features, they are going to go badly astray with intensional features. Consider, e.g., RR believes Holmes is a set; RR believes Holmes is distinct from {$\underline{f}$: Holmes $\underline{f}$}, etc.

The nonreductionist point of a theory like Meinong's has thus been lost. And many of its applications have likewise been sacrificed. It is true admittedly that the new theories can serve some quite limited purposes, e.g. they are useful for modellings, and perhaps (should this be thought worthwhile) in convincing hardliners that we can talk sensibly about objects and make "good" classical sense of much of Meinong's theory - by rendering it another platonistic extravagance. But these are trifling gains (with their own costs). The net result is very serious nevertheless. For a great many of the philosophical and theoretical tasks to which a theory of objects can be fruitfully applied (e.g. those noted in 1.1) are ruled out by the new theories.

3. Some remarks on Castañeda's theory of 'Thinking and the structure of the world'. Castañeda sees his 'basic system of ontology' as

> a nice formulation of a conception of the world that was started by Plato, was envisioned by Leibnitz, guided Frege, at least in part, and was defended by Meinong (74, p.3).

The system is said to solve very many fundamental philosophical puzzles (pp.3-4, p.39), but it is left to the reader of Castañeda's 74 to 'assure himself that this is so' (p.39). Unfortunately the reader is severely handicapped in this task by having only an informal presentation (p.10 ff.) of the system giving the ontological structure of the world to work with.[1] Even the underlying logic is not stated, though it can be inferred from the use of classical symbols and such remarks as 'genuine identity is as it is normally conceived to be' (p.12) and 'provided that "F_1 &...& $F_n \supset G$" is a theorem in standard quantification logic' (p.16), that the underlying logic includes classical quantification logic with Leibnitz identity and with several additional improper symbols, in particular predicate (or property) negation, which appears without previous notice in a thesis of the informal system, and the cosubstantiation relation C^*.[2]

It is a mistake to see Meinong's theory of objects in the historical tradition in which Castañeda sets it, especially that of Plato. For 'the fundamental assumption of the system, namely its Platonism' (p.39) was very definitely not an assumption of the theory of objects. According to Castañeda 'the ultimate components of the world are Forms, and these divide into properties and operators'. The properties of the system are n-place relations, for any natural number n (thus propositions are 0-place, or 0-rank, properties). An operation of variabilization transforms these properties (identified with abstract properties) into propositional functions (identified with concrete properties),[2] from which individuals are composed. An operator, represented by braces, operates on components and forms sets (said to be abstract individuals). The composition operator c, 'operates on sets of monadic properties (or propositional functions), whether single or complex, and yields concrete individuals', i.e. individuals, said to be, 'roughly, Frege's senses of definite descriptions' (p.11). Three distinct individuals given as examples (again the examples do not exactly match the final account and extra assumptions are involved) are these: the round square = c{being round and square}; the individual composed of the properties of roundness and squareness = c{being round, being square};

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[1] Nor, a search of the literature appears to disclose, is an explicit formal presentation to be found in Castañeda's more recent publications, several of which depend on the theory of 74. In later papers the reader is regularly referred back to 74, as if it were definitive ('all of this is explained' in 74).

[2,3] (Footnotes 2 and 3 on next page.)

Meinong's favorite impossible object = c{being Meinong's favorite impossible object}. Castañeda says 'Clearly whatever property Fness we consider, the Fer is F, and necessarily so' (p.11) for the primary predicational sense of 'is'; and quite erroneously attributes such a claim to Meinong. Nor it is at all clear without further assumptions: to suppose so is to make the serious mistake of taking it for granted that an object has all the properties it presents itself as having or is described as having. Castañeda does however supply the further - very damaging - assumption in the form of a truth condition: that a(F) [intended to be read 'a is F']

> is true, if and only if the property denoted by 'F' is member of the set of properties constituting the individual denoted by 'a' (p.11).

The result is systemic disaster. For no restrictions on properties are even hinted at and complex properties are freely admitted. Consider, for instance, the individual c{E, R, R^-}, d say, where E is the property of self-consubstantiation,[1] in terms of which existence is defined (p.15), R is roundness, and R^- is the property of being false that roundness applies (i.e.

(Footnotes 2 and 3 from previous page.)

[2] The logic that is presented appears to contain certain, rather common, errors. For example, Leibnitz's law, presented as a 'fundamental ontological principle' for 'genuine identity as it is normally conceived to be', is stated in reverse notation thus:

Id. 2a. $x = y \equiv (x(F) = y(F))$,

instead of the normal quantified form: $x = y \equiv (F)(x(F) \equiv y(F))$. (Id. 2a. persists through three different versions of 74, two published and a preprint reducing the likelihood of the two (?) defects being more misprints.) Castañeda's Id. 2a. has the consequence that if individuals x and y are identical in some one respect, they are identical. The fact-indiscernibility of individuals, (law Id. 2b, p.12) is formulated using the notation $\phi[a/b]$ explained without due restrictions on replacement to exclude binding of variables upon replacement. It seems to be assumed that the indiscernibility principle follows from Id. 2b, but it does not without both a principle linking the unexplained connective = with ≡ and either some powerful second-order principles or else (for first-order induction) several further principles for new improper symbols (to facilitate proof of the induction step). And so on. However all these things are easily rectified, and do not tell against the intended theory.

[3] The examples that can be found of the operation do not blend with the description: e.g. roundness transforms to being round, instead of (—) is round or x is round, what it seems it should be for variables to enter and the result to correspond to Russell's notion.

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[1] Alternatively in terms of Castañeda's "propositional function" E is being self-consubstantiating.

$\lambda x{\sim}xR$). By the truth condition, applied three times, dE, dR, dR^-. But $dR^- \equiv {\sim}dR$. Hence, by adjunction dR & ~dR, violating noncontradiction, and dR & ~dR & dE. Since $dE \supset dR \equiv d{\sim}R$ (see p.15), dR & d~R, whence (p.15) ~dE. So too dE & ~dE. Further, since the underlying logic is classical, the system is trivial. In fact the derivation of a contradiction from $c\{R, R^-\}$, the round not-the-case-that-it-is-round-object, is enough to collapse the system, since on it 'the law of contradiction must prevail throughout the realm of truth' (p.21). Almost all[1] the objections brought against unrestricted Characterisation Postulates apply against Castañeda's theory. Triviality results very directly as follows: Let s be an arbitrary false proposition not in the system, and consider p = c{being true, materially implying s}. Then, by the truth condition (and the Tarski biconditional), p and also $p \supset s$, whence s.

Thus Castañeda's theory requires substantial revision as well as more precision. Some restriction of the class of properties that are reliable is essential; and this Parsons' theory, with its distinction (after Meinong) of properties into nuclear and extranuclear properties, provides. No doubt the requisite formal revision and elaboration could be undertaken. Even so the theory would remain thoroughly unsatisfactory in fundamental ways, in particular because

(a) the Reference Theory is deeply embedded in the theory, and

(b) the theory is based upon the assumption that there are several (at least three) different modes of predication (indeed this is the way in which it can live with the Reference Theory).

As to (a), the platonism of Castañeda's theory has already been observed: it is a conspicuous and much emphasised feature of the theory (see, e.g. p.39). The items of the theory are one and all entities,[2] and the investigation of the theory is ontological. Identity is Leibnitzian.[1] However much of Castaneda's theory can be recast nonreferentially, and many of his important insights can be recovered in a more satisfactory setting. As to (b), the main distinction is that between (what is variously called) 'Meinongian predication' and 'consubstantiation' (pp.12-13) or between 'fictional predication' and 'actuality predication'.[2] The distinction involves finding ambiguities where (so it has been argued) there are none, e.g. in 'The golden mountain is golden', 'Pamela had rented again the old bungalow at 123 Oak Street'. Castañeda's argument (in 79) for the ambiguity of the predicate in the latter sentence (in the two different contexts in which he sets it) is basically that the sentence is ambiguous, and that the ambiguity cannot be satisfactorily located either in the subject or in the predicate term. But the sole argument that the sentence is ambiguous[3] is that in different contexts (one fictional and one "real") it yields different statements; and that does not establish ambiguity (as Castañeda's example 'This is red' should have revealed: see also Slog, chapter 2). The case for ambiguity of the copula, for two modes of predication, is however argued directly by Rapaport, who presents (in 78) a theory with much in common with Castañeda's.

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[1] The qualification is called for because it suggested, firstly, that some predicates ('exists' perhaps) do not fully express properties, and, secondly, that some restriction on predicate abstraction is supposed, e.g. (p.12) 'entering into a fact is, of course, not a property.

Subsequently in 76, Castañeda asked what 'criteria for the selection of properties' says 'I do not mind saying that they are first-order properties' (p.114): even if adopted this is still not sufficient for simple consistency.

[2] Castañeda's theory is at root, and requires, a levels of existence theory, with at least two modes of existence (corresponding to the main modes of predication): that of (underlying) reality and that of actuality. Both are said to be 'mysterious'. 'Actuality, which accrues to concrete individuals, is most mysterious' (p.12):

> Existence is mysterious. It is rich and complex as shown by its laws; it is what in the end the whole of thinking and acting is about. Yet it seems redundant and empty. As Kant put it, "the real contains no more than the merely possible". More specifically, for any property Fness, the existing Fer is the same as the Fer (p.21, emphasis added).

Arguments have already been adduced in earlier chapters against all these claims.

But Castañeda is not altogether happy about the two modes and regards 'the nature of existence' as 'a most serious problem'. For he is reluctant to say both of what he does say, that, on the one hand, all objects of thought exist and that, on the other, existence differentiates among objects of thought (cf. p.9 ff.).

4. Rapaport's case for two modes of predication and two types of objects. Rapaport's 'modified Meinongian theory' (of 78) is yet another reductionistic theory of a referential cast, aimed at reducing nonentities to entities, once again sets (or bundles) of properties: 'Meinongian objects which are constituted by properties' (p.162) 'are actual' (p.162, p.167). Rapaport argues from a distinction between two modes of predication, to a distinction between two types of objects, actual physical objects and Meinongian objects - the aim being to expand Meinong's act-content-object distinction to a four part distinction with the two types of objects. (Main difficulties with the act-content-object distinction simply transfer to this distinction.)

According to Rapaport,

> the paradoxical flavor of Meinong's famous statement that there are objects of which it is true that there are not such objects can be tempered somewhat by suggesting that while there is always an object of thought, there isn't always a physical (say) object corresponding to it. Let us call the former the Meinongian object and the latter [the one there isn't] the actual object (p.154).

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[1] 'Identity is, naturally, as always exhaustively totally reflexive and abides by so-called Leibniz's law', 'so-called contingent identity is not strict or genuine identity' (75, pp.129 and 133). 'I am committed to a strong version of indiscernibility' (76, p.115). Castañeda's complex theory of guises (or appearances) is required principally in order to prop up Leibnitz's Lie.

[2] There is also a parallel (but doubtfully identical) distinction between 'internal' and 'external' modes of predication: there are said to be several cases of external predication.

[3] Elsewhere there is little argument to be found either for the alleged differences in modes of predication or that there are the ambiguities the differences imply and that call for the distinctions; e.g. in 74 there is nothing (but a suggestion on p.13), the differences are simply taken for granted.

A paradoxical flavour, which is easily removed by distinguishing 'is^E' and 'is', is not tempered by adding to the appearance of paradox, in particular by saying that when one thinks of President Carter there are two objects involved, as well as 'a Meinongian object ... there is in addition the actual physical object, viz. President Carter'! This does not answer to experience (cf. the scorn Reid poured on the two objects the theory of ideas so frequently delivered in place of the one object of commonsense).

Nor is such a distinction of objects - not part of Meinong's theory - in any way required by Meinong's theory, certainly not the theory encapsulated in the nine theses Rapaport usefully assembles (p.154 ff.). For the nine theses are satisfiable (rather easily, since they include no CP of strength) by theories without distinctions of the type Rapaport makes, of objects or modes of predication.

Nor are the distinctions otherwise required, and the leading argument given (p.160 ff.) fails.[1] Rapaport claims to find a semantic difference between

(3) My gold ring^E is golden (which is contingently true), and

(4) The golden mountain is golden.

For - so Rapaport contends -

R. Nonexisting golden mountains cannot be made of gold in the same way as existing golden rings are (p.161).

So how is the difference to be accounted for? There are three possibilities:-

(i) a difference in subjects;

(ii) a difference in predicates; and

(iii) a difference in modes of predication.

(The underlying picture is traditional, with judgments consisting of subject and predicate linked by a predication relation.) Rapaport rules out (i) and (ii) which leaves (iii) (cf. Castañeda's procedure above). Possibility (ii) is correctly ruled out on the grounds that there is no difference in the word 'golden'; it is not ambiguous, and its meaning can be explained in the same way in each of (3) and (4). But (mutatis mutandis) precisely the same could be said, correctly, as regards possibility (iii): 'is' does not vary in meaning from (3) to (4) any more than 'golden' does. And that observation is enough to break Rapaport's argument!

Is there really, as alleged, a semantic difference: is it true that golden mountains cannot (be made of) gold? What is the force of 'in the same way'? These crucial things, Rapaport does not explain. The only way Rapaport arrives at a semantic difference is by deliberately imposing one (where there appears to be none), by introducing distinctive symbolism and semantics for 'is' as between (3) and (4).

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[1] The other considerations adduced, e.g. 'the historical precedence of Castañeda's recent theory, carry little weight - particularly since Meinong's theory gives no support to the proposals, and as Castañeda's theory is said not to be 'intended as a version of Meinong's theory' (p.168).

On the intuitive data, Rapaport is astray. Neither (3) nor (4) says anything about 'being made of gold', as is assumed in R. Depending on context, the objects could be painted gold, bathed in golden light, etc. Rapaport's question should presumably be: Can both objects be golden in the same way? For this a critical issue, already answered at length, is: Can a nonentity such as the golden mountain have properties? The answer is: of course nonexistent nonactual objects can have properties; so presumably the nonactual golden mountain can be golden. To deny this would be to reinvoke the Ontological Assumption. But just such a move underlies Rapaport's thinking, e.g. (p.174), where he considers denying 'that M-objects [i.e. Meinongian objects] are actual; for then they would not exemplify any properties'. The pressure to manufacture a semantical difference is then referential. This explains also why Rapaport speaks of solving 'the problem of how non-existents can have properties' (p.161). For without the Ontological Assumption there is no problem to solve.[1]

5. Parsons 1974 to 1978: transition from reductionism. In 74, Parsons 'tried to develop a version of Meinong's ontology that is clear, consistent, and immune to Russell's attacks'; in 75 he applies the 'theory to an analysis of fictional objects' (75, p.73). The theory of 74 is set out as a rather formalistic exercise: 'I'm going to represent Meinong's theory within a set-theoretic reconstruction of the theory', without arguing 'for the truth of the theory ... a first step in Meinongian scholarship is to get a version of his theory that is clearly consistent and to find some interesting uses for it' (p.563). All very questionable;[2] however, it sets the programme of 74 and to a large extent that of 78. But for one thing. Already in 75 Parsons was looking 'for reason to believe that it's true'. But 'the only evidence that we ever have in favor of a general metaphysical theory is that it has interesting applications' (p.73). The claim is surely mistaken: false theories often have interesting applications, and there are many other factors involved in and constraints upon theory choice (Routley 79).

The set-theoretic reconstruction is a set-theoretic reduction. Objects are sets of properties (74, p.565, p.580), an equation criticised and rejected back in 8.3.[3] The equation is rejected by Parsons 78: 'I am not saying objects are sets of properties'. The new picture, adopted in 75, merely correlates objects with sets of properties: objects are not reduced. By 78, the new picture and the theory of 74 and 75 has largely vanished into a brief and 'crude' introductory sketch, which is at once discarded (except in the subsequent consistency argument): 'we can dispense with talk of lists and correlations and present the theory in a more direct manner ...' (p.13).[4] The fuller theory is a predominantly logical theory of objects, in which objects are not reduced: object terms are taken as primitive, and subject to axiomatic constraints. There would be no justice then in assimilating Parsons' fuller theory to Lockean reductions.

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[1] Rapaport's modified theory appears to be in serious logical trouble on certain points; but since the theory is trivial (see 78, p.171), there is little merit in considering them.

[2] And not exactly the course Meinongian scholarship has followed, most of it including an attempt to argue to the falsity of the theory - for which purpose a consistent version is something of a handicap.

[3] A body of literature criticising Parsons 74 and 75 is beginning to arise; see, e.g. Rapaport 78, Howell 79.

[4] Page references to Parsons 78 follow those of the (incomplete) August 1978 typescript.

There are other modifications, some of which bring the 78 theory closer to the theory of items. In 74 it was taken for granted that properties and other abstractions exist: in 78 it is not longer, but it is said, truly but evasively, that they exist if they do exist (I9). At least it is left open that they do not exist - a definite improvement. As a result, however, of the openness, the theory is cut off from important applications of the theory of items, and is essentially confined to nonexistent particulars. Hence the emphasis in applications on fictional objects and the like.

Several things do however transfer more or less intact to the 78 theory, most notably the theory of "relations". In a sense, all relations are reduced to properties.

> Syntactically, all relational predicates work in the language by first being converted into complex monadic predicates by having one end plugged up with a singular term (74, p.575).

It is similar in 78: the only atomic formation rule is for one-place predicates. Though no doubt formally sound (because sufficiently restrictive in what it permits), Parsons' difficult theory is decidedly artificial. The formalism does not correspond well to anything given in natural language - except, maybe, what has a much more limited and (usually) different role, hyphenization, and even this connection is lost with predicates of more than two places. The theory is difficult to apply, especially in symbolising natural language, because it forces numerous choices, e.g. as to which way to plug up a given n-place relation, where none are normally made, and mostly are not required. Indeed it induces multiple syntactic, and reflecting this, semantic ambiguity, where there is none. For example, an unambiguous n-place relation can become ambiguous in n! ways on the theory.[1] The theory of "relations" may be something to fall back upon as a last resort, but it is to be sincerely hoped that the situation with nonentities is not that desperate. The evidence is that it is not (cf. 7.7).

Notwithstanding, the theory of Parsons 78 is very congenial to many of the main theses that are argued for in this book, much more so than any work that has been published in the last half century.[2] Naturally there are significant - indeed fundamental - differences on a great many issues (as readers will quickly ascertain). But even these are diminishing as the respective theories are elaborated. It would be pleasant to find that this partial convergence is controlled by the data - logical and linguistic, factual and commonsense - that the theories are trying to reflect.

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[1] The theory as developed imposes a sharp - an artificially sharp - division between nonentities and entities: all the problematics of plugging up and associated ambiguities suddenly vanish when only entities are involved. But nonentities are not so very well-behaved relationally, as intensional paradoxes among others show. There is no due recognition of the different types of nonentities, or of the way in which for some nonentities, e.g. those of certain theories, relations can be admirably behaved: again this reflects too limited a focus of the theory on fictional items. However there is some scope for improvement of the theory in these regards.

[2] (Footnote on next page.)

§5. *The Noneist Rejection of Reductionisms and Repudiation of Mediatorial Entities.* Two aspects of noneism, not given much prominence in the initial statement of position (p.1 ff.), that should have emerged clearly in the course of the book are, firstly, the emphasis on irreducibility and, secondly, the proper prejudice against intermediary entities and other middlemen. The aspects are of course interconnected: intermediaries of the right sort are mostly introduced in order to effect reductions, and reductions typically proceed throuth intermediaries.

In its general rejection of reductionism noneism (which also abbreviates 'nonreductionism') joins forces with the modern swing, of ecology and the counterculture (see Roszak 73, p.264 ff.), against reductionism. Some of the reasons for the rejection are the same, some are different, partly as a result of the difference of subject matter, partly for more substantive reasons. For example, noneist opposition to, say, attempts to reduce religion sociologically is not that there exists a supernatural being or a spiritual realm that reductionism is aiming illegitimately to remove. For there exists, it certainly seems, no such being or realm. Even so most religious discourse remains intact (though truth values may change substantially), and cannot be dissolved by mere sociological or psychological analysis. (Of course related analysis may help in explaining motives for adopting such a religious language-game).

Naturally the noneist rejection is not of all reductions - some local or limited reductive analyses, or rather extensional identifications, no doubt succeed - but of reduction programmes of a fairly comprehensive character, especially philosophical programmes. (Terms such as 'programme' are chosen advisedly in talking about philosophical reductionisms, as it cannot be pretended that many of the proposals from the prodigious passing philosophical show have succeeded.) Nor is the rejection merely for the obvious reason that large scale reductions almost invariably oversimplify (and uniformize) and so falsify. The deeper reason is that with noneism the point of reductions commonly disappears. The reason is that most reductions arise from ontological worries and are intended to be ontological reductions,[1] to show that the thing

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[2] (Footnote from previous page.)

Largely for this reason, but partly because the work has yet to attain final form and be published, the original idea of a detailed commentary on Parsons' theory was abandoned. The theory, as presented by Parsons, speaks splendidly for itself: it has very considerable virtues - as well as, from a noneist viewpoint, substantial limitations, some of which have already been alluded to, and some of which flow from the fact that, like Meinong's theory, the theory has not succeeded in breaking free of the Reference Theory. To begin pointing out other limitations would lead to a commentary.

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[1] The point applies also to reductions such as those the theory of descriptions, and more generally those of the theory of logical constructions, were intended to effect. For the assumption (again a result of the OA) was that unless a reduction like that of the theory of descriptions was effected one would be forced to say that such items as Pegasus and other "nonentities" existed.

eliminated does not really exist, at least not independently, but only as or through something else to which it reduces.[1] Yet commonly the thing reduced does not exist, but is taken to exist because it has, or seems to have, properties, i.e. the Ontological Assumption is at the back of the worries. So should one simply say, as noneism does: the thing does not exist though it has properties, the point of such reductions vanishes.

Once again the case of minds affords a good example. Minds have properties, e.g. creatures have minds, some minds are good and others less good, minds develop and deteriorate, and so on. Ontological worries arise because a leap is made - the Ontological Assumption is supposed to justify it - to the existence of minds; whereupon minds become problematic and seem to acquire all sorts of strange and puzzling features (compare the situation with universals as Reid explained it). Minds are queer places with weird, ghostly transactions and happenings: remember especially Ryle's initial build-up of the Cartesian myth in The Concept of Mind. So a reduction, or redescription of logical geography, programme and associated therapy is called for; a programme like Ryle's and Wittgenstein's, or differently those of the materialists, etc. But of course minds do not significantly have spatial location, minds are not places, queer or otherwise. Minds do not exist, because they do not satisfy spatial requirements on existence and the like, and accordingly they are not loaded with all the paraphernalia existents are bound to have that cause the main puzzles. Thus the point of reduction programmes, of relocation of concepts, and the rest, disappears.

Reductions in philosophy, especially in the face of sceptical arguments, have lead to the introduction of a great many mediatorial entities, much as the rise of capitalism and bureaucracy have lead to the imposition of many middlemen in production. Thus, for example, as Reid points out,

> philosophers have been led to think that, in every act of memory and conception, as well as of perception, there are two objects - the one the immediate object, the idea, the species, the form [the content]; the other, the mediate or external object. The vulgar know of only one object, which in perception is something external that exists ...; and, in conception, may be something that never exists. But the immediate object of the philosophers, the idea, is said to exist, and to be perceived in all these operations (Works, p.369).

Of course the philosophers usually had reasons for the introduction of these intermediate entities, much as capitalism usually found reasons for its middlemen. As Grave remarks,

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[1] There is something a bit rum about ontological reductions as they are often presented, namely as furnishing identities. For if the reduction is a correct one it identifies (extensionally at least) the thing reduced with something else which (normally) exists. So the thing reduced does exist after all, since existence is transparent, so in a sense no ontological reduction is achieved. It is thus decidedly misleading to present ontological reductions, in the way they are often presented, as showing that certain objects (e.g. minds) do not exist. In another sense something is achieved, because it is shown that the thing reduced is nothing but a certain other existent, so a reduction in the apparent number of entities is achieved.

> Most of the familiar reasons for a theory of ideas were curiously ignored by philosophers of the Common Sense school. They are all silent about the objects of false beliefs and memories (60, p.25).

It is not difficult to see however that arguments such as that from false memories to intermediate objects are quite inconclusive. Grave sketches the arguments (already considered from a different angle in 8.10):

> We have false memories and these have no intrinsic marks to distinguish them from true memories. While the object of a true memory could perhaps be a past event as it actually was, the object of a false memory could not be an object as it actually was. The false object must be an idea (60, p.24).

Not at all. The object of a false memory would simply be an event or thing that did not happen or exist. Without an Ontological Assumption, no shift to surrogate entities such as ideas is needed. The argument continues

> ... how could an idea of an event be mistaken for an event? We can only suppose that the direct objects of both true and false memories are ideas, the one corresponding and the other failing to correspond to something that actually happened.

But it is far simpler to say that the objects in both cases are things or events (one doesn't, except in special cases, remember ideas), in the one case the thing did exist, the event did happen, in the other case they did not. Thus it is simply false[1] that

> Nothing but Reid's superstitious horror of the idea theory could have prevented him from seeing that the faculty of memory is necessarily 'mediate' and 'representative'.

Here as elsewhere intermediary entities are not required, or admissible, but are best, to use a term drawn from the opposition, banished. Really, however, it is not that these intermediary entities exist to be banished; rather they do not exist. But in a theory where nonentities are admissible, the intermediaries are entirely otiose.

Intermediaries like the ideas of the ideal theory appear in almost every reach of philosophy, and in each area "banishing" them is a first important step in trying to resolve problems of the area. A central philosophical area where intermediate entities have not been recognised for what they are, or the damage they do, is the theory of meaning.

The customary, and frequent, demand for a theory of meaning derives from the Reference Theory. Some notion of meaning, or sense, distinct from reference, is essential, given the Reference Theory, wherever the extensional account of reference fails, in particular to accommodate cases of empty reference and cases of reference in opaque frames. Hence the characteristic introduction of such auxiliary entities as senses, meanings, intensions, and so on. Without the Reference Theory, much of the point of these introductions vanishes; one can simply take over a modified version of Reid's view, that a word is directly related to the world, that there exist no psychological entities, ideas, concepts, meanings, or the like, floating (or otherwise figuring) in between. Intermediaries and middlemen do not exist, and as objects they are largely otiose.[1] A theory of meaning, as ordinarily understood and sought, is then not a desideratum, but a liability.

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[1] Hamilton's claim that

> An immediate knowledge of the past [Reid's phrase] is a contradiction in terms (Discussions, 2nd edit., London 1853, pp.49-53);

is likewise false. Where no intermediaries are involved, knowledge can be said, to emphasise the contrast with mediatory theories, to be immediate - without inconsistency.

But just as the noneist rejection of reductions is not of all reductions, so the noneist repudiation of auxiliary objects is not of all auxiliary nonentities. When auxiliaries really do work, work in making a theory function successfully, instead of complicating or sabotaging it, or work in explicating the data, such as features of (say) fictional discourse, then auxiliaries are welcome.

§6. *The noneist and radical noneist programmes*. These programmes involve not only a critique of rival programmes and in particular of entrenched positions and of the status quo, but, what is more important, the following: firstly redoing things, things that have mostly been done referentially and badly (in their way, according to their precepts and theses), and secondly doing things that have been left undone, for instance theories that have been dismissed or discarded or never (much) investigated by prevailing or by historical positions.

A major part of the noneist programme will naturally consist in extirpating the Reference Theory, especially in removing all facets of it from its blighting (often paralytic) role in philosophical and foundational thinking. It is most important however to avoid having all research activity caught up in defensive work, such as in disputes with entrenched positions over preliminaries, so that the major tasks of advancing the programme and elaborating the theory - what will often be the best way of meeting opposition anyway - never gets done.

Radical noneism goes further than noneism. The classical logical programme is, as Priest has explained (in 79a), a degenerate research programme. The radical noneist, or ultralogical, programme is a replacement for the classical programme. It is a programme which shares much with what the classical programme possessed in its more vigorous days, a rationally based belief in the centrality of its logic, the importance of argumentative and analytic methods, of counterexamples and refutations, etc. But the classical and radical programmes differ sharply, in the ways that have already been indicated, ways emanating from the respective rejection and acceptance of the Reference Theory and its elaborations, and of the Consistency Hypothesis, i.e. the thesis that the world $\underline{\underline{T}}$ is consistent.

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[1] Largely but not entirely, as earlier sections indicate. Of course words have senses, and it is sometimes useful to speak of senses, to distinguish different senses, and so forth. But from this it does not follow that senses exist. Nor does it emerge therefrom that determining a theory of sense is a major philosophical enterprise upon which much else turns. It is not. The modern quest for a theory of sense or of meaning is really, as our English friends should say, a bit of a bore.

12.6 HOW MUCH THERE IS TO EXPLORE

The new programme is only in its early stages of development. How much there is to do, the very considerable extent and ambitiousness of the research programme, earlier sections, especially 1.23 and 11.2, (should) have revealed. The programme is spelt out in some detail in the Appendix (i.e. UL) and in DLSM. When so much is still to be done it is bound to remain unclear to what extent the programme can succeed. In particular, it may just be that there are sharp limits upon what can be achieved using paraconsistent theories, limits that have not yet emerged.

It is partly for this reason, as an escape route, that the elaboration of the theory has been left open at several points, and that both consistent and paraconsistent options have been investigated. But it is also because the best direction of travel is not yet clear, or, in other cases, certain, that various alternative routes have been left open (especially in the theory of fictions).

Although, as is evident, some of the elaboration of noneism is tentative, the basis is solid, and many of the main features are clear. And it is clear that the theory bids well to resolve or at least sort out a great many philosophical puzzles and difficulties. Hopefully too it is clear from this limited expedition that much in and beyond Meinong's jungle, much concerning the rich and varied logico-philosophical forest and its denizens, is worth exploring and would reward further exploration.

PREFACE TO THE APPENDIX

The Appendix reproduces, in essentially original form, the paper 'Ultralogic as universal'. The paper is reproduced here for two main reasons: firstly because it illustrates and elaborates several of the paraconsistent themes of the text, and secondly because copies of the original, which are in some small demand, have proved hard to acquire.

The paper does however require updating, to take account of new developments, and of criticism; in at least the following respects:-

1. The nontriviality of dialectical set theories of interest has now been established, closing the second important open question raised on p.934. Brady has announced the nontriviality of system DST (on p.923) and of several other systems in the vicinity of DST (all of which lack however not merely contractional principles of Anderson-Belnap relevant logics, but also exported syllogistic principles), and, independently, da Costa and Arruda have announced the nontriviality of (weaker) systems obtained by adjoining an unrestricted axiom of set comprehension to quantified P systems and surrounding systems. (These important results are all to be published in Paraconsistent Logic, edited by G. Priest and R. Routley, (in preparation).)

   Important questions for paraconsistent set theories, now that they have been cleared of a triviality charge, are, firstly, what can be achieved using them, especially in the direction of formalising various parts of intuitive mathematics; secondly, to what limitations they are subject, if any of weight and thirdly, what, and what types of, consistent subtheories they contain (the last appears to afford a promising way of establishing the consistency of certain extant set theories).

2. Many of the claims advanced in the Appendix are, of course, very controversial, and require (as Newton da Costa has brought out in a detailed commentary) further defence or elaboration. While this can almost always be supplied, neither the work nor the reorganisation so called for have yet been undertaken. Two matters especially require much elaboration:- Firstly, a fuller explanation is needed as to how within the myriad of logics, correct logics can occur, and be legitimately distinguished, i.e. what the criteria for correctness are, and what justifies these criteria. Secondly, there is the question of the character of the extrasystematic logic, or metalogic, of paraconsistent (and relevant) logics; ultimately such logics should determine, and supply their own metatheory, or equivalent, and certainly should not rely on what may be classical theorising which is not paraconsistently admissible. Both these important matters are pursued in the final chapters of RLR.

3. The position adopted at the end of §5 (bottom half of p.911) requires emendation: as to how see DLSM (reference [59] of the Appendix).

APPENDIX I

ULTRALOGIC AS UNIVERSAL?[*]

§1. *A universal logic?* A universal logic, in the intended sense, is one which is applicable in every situation whether realised or not, possible or not. Thus a universal logic is like a universal key, which opens, if rightly operated, all locks. It provides a canon for reasoning in every situation, including illogical, inconsistent and paradoxical ones. Few prevailing logics stand up to such a test. Certainly neither classical logic, nor the main alternatives to it offered, such as intuitionistic logic, are so universal. For they fail entirely in impossible situations. Moreover they are decidedly suspect even in apparently realisable cases, such as the empirically realisable situations of various semantical paradoxes and the situations of quantum physics - with the result in the latter case that it is sometimes suggested that classical logic is, like classical physics, only a good approximation to the empirically-selected and confirmed theory at the macroscopic level. The philosophical breakdown or impasses when classical logic is insisted upon are much more widespread still. And these breakdowns count against a logic's claim to universality; for a universal logic should be adequate both for mathematical and philosophical purposes - and also for logical functions in other areas such as biology, economics, astrology, theology, and so on.

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[*] Caveat. The projects sketched out in this paper are in many cases programmatic, and in a very early stage of development. Since the procedures outlined often represent only a first attempt at seeing how an ultramodal theory would cope, the failure of given facets - by no means improbable - does not condemn the ultralogical program being proposed. Hardly necessary to say, failure of all likely approaches, or a suitable impossibility result, would condemn the program.

Though the ultralogical procedures sketched are mostly tentative I have avoided clogging the paper with appropriate qualifications, and, in the interests of feedback and of falsification of the conjectures, have often gone out of my way to state the theses in a bold and provocative way. Hopefully a more detailed and careful elaboration and defence of the various theses will be published subsequently (in collaboration with others). In fact much of the paper is a preview of [29]. But, because the paper is a survey one, it carries a heavy burden of references, particularly to work on relevant and dialectical logic published or to be published elsewhere.

I am aware of a heavy debt to several others to whom I owe some of the ideas tried out or through whose stimulation or assistance I arrived, separately or jointly, at the ideas tried out. Often too these others have arrived somewhat independently at the same ideas. I should mention, in particular, Ross T. Brady, J. Michael Dunn, Roberk K. Meyer, and Valerie Routley. On the other hand, none of these others would, I suspect, approve, by any means, of all I propose, and I would not want to saddle them with the whole program. The relevant program can take many alternative routes to its foundational goal, and that I have chosen is only one, and perhaps an idiosyncratic one.

A.1 AN ULTRALOGIC CAN BE APPROPRIATELY UNIVERSAL

By selecting an ultralogic (i.e. an intensional logic which goes far beyond the modal[0] in the classifications it considers) as instrument of reasoning and argument assessment, very many of these gratuitous philosophical difficulties are avoided or resolved, in ways I will try to sketch out. And a relevant logic which does this can be appropriately universal. It can apply, without smudging all distictions, in impossible situations. It can apply in radically incomplete situations, and combined with intensional probability logic, which its use as a logical base dictates, it can deal with quantum anomalies. This too I will try to argue.

In short, an ultramodal logic can work everywhere. But it can work without serious logical loss. For, in particular, classical logic can be recovered in those situations (consistent and complete ones) where it is valid. Likewise other logics can be enthymematically recovered for the situations for which they do hold; and classical mathematics should be recoverable, insofar as it is correct.

These features - universality coupled with adequacy for the recovery of mainstream logics under appropriate conditions - provide initial support for the proposition that a relevant logic (with a suitably weak higher degree) would be a good choice as foundational logic, as the logic which is adopted in foundational studies, e.g. in the sciences, in linguistics and in mathematics. Indeed if such a logic really does formalise the central foundational relation of deducibility, as I believe, then it should be a best choice.

One would of course have to be wildly optimistic, and historically naive, to expect that anything is going to dislodge classical logic from its privileged position in foundational studies. It is too well-entrenched,[1] and too well-hedged around with defences. But this does not mean that one cannot see that there are better choices than those that are entrenched, and investigate to some extent the results of making an apparently better choice.

Nor is the idea of a universal logic some sort of transcendental illusion (as some have suggested the notion of a universal language or a universal science is). One source of the illusion claim is the view that one can never encompass in advance all situations. But generally logics proposed, notably first traditional logic and later classical logic, have claimed to be appropriately universal, to deal with all-comers among situations, to exhaust the cases (though what they really do is to rule out, as not situations, cases where they don't apply or where they break down). It is patent now that traditional logic failed rather conspicuously in its claim to be universal (though there are still defenders of the Aristotelian faith about, trying to extend the apparatus to cover previously written-off cases). It will become clearer, I hope, why classical logic is similarly, if perhaps not quite so conspicuously, inadequate. Why does any heir to classical logic in the historical chain - ultramodal logic, for example - stand a better chance of success?

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[0] A modal logic is, as usual, one where strict equivalents or provable material equivalents are intersubstitutable everywhere for one another preserving truth or provability. Classical logic is modal in this sense. An ultralogic is an ultramodal logic, primarily a logic which goes beyond the modal, where modal substitutivity conditions fail. But it is also supposed that an ultralogic has other desirable features, e.g. it includes a good implication, as well as a full complement of extensional connectives.

[1] It should be noted however how recently it became entrenched - only really since the second world war. Traditional logic had a vastly longer life span.

The reasons to hope for success are, I think, of two connected sorts. The first concerns the way ultramodal logic applies, and the second concerns the intended interpretations of the central deducibility relation. Firstly, ultramodal logic applies in a reasoning situation c not by importing all its logical luggage into c, but through having situation c conform to its principles. Logical laws may fail in c (suppose, e.g., c is the set of Hegel's, or of some tribe's, beliefs). One draws out the consequences of what holds in c, e.g. of D in c, not by adding the thesis $D \rightarrow E$ to c, obtaining $D \& (D \rightarrow E)$ in c, and applying Ass, $D \& (D \rightarrow E) \rightarrow E$, in c to obtain that E holds in c. Rather one observes that the deductive consequences of D are obtained by closure of c under provable implications of the logic, so that where D holds in c and $\vdash D \rightarrow E$, E holds of c. Nothing says however that $D \rightarrow E$ holds of c; and it may indeed fail.

More generally, there is an important distinction many people are familiar with, but which classical and modal logics cannot draw, between a situation c's conforming to a law, of c's being lawlike, on the one hand, and of the law's holding in or belonging to c, on the other. At one extreme a situation may be lawlike though no logical laws hold in it (the null situation provides a degenerate example). Thus the application of ultramodal logic is not limited to consistent or to logically regular situations.[2] Its chances of success are thereby greatly enhanced.

Secondly, the central deducibility relation of ultramodal logics, entailment, is intended to capture the notion of sufficiency. This means, in particular, sufficiency of the antecedent of an entailment on its own, without any additional imported truths, especially imported logical truths. Thus entailment can work where an enthymematic implication cannot, because the imported truths may fail. Sufficiency is a go-anywhere notion, which is not limited by the fact that the situation in which it operates is somehow classically incoherent, e.g. inconsistent or paradoxical. If A is sufficient for B then it does not matter what else goes on; logical laws may go haywire but nothing subtracts from A's sufficiency. Incidentally this means also that, given A's sufficiency for B, A and anything else D is also sufficient for B. (Thus $A \& D \rightarrow A$ is correct, and connexivism is eliminated as an option under the intended sufficiency interpretation.) Finally, since one is operating with a go-any-place logical notion one would expect general success.

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[2] In [3] relevant sentential logic is enlarged so that it combines with all sentential connectives and caters for all situations. Observe however that it is not required, and would not be correct to require, that all set-ups the semantics considers are closed under relevant deducibility; non-deductive situations of course are not.

It should be remarked in passing that logical sufficiency - as coupled with related intuitive models for deducibility such as those of total content inclusion and of containment - is what is really fundamental to the logics being promoted. Relevance of consequence to antecedent, though a hallmark of an adequate implicational relation, is strictly a by-product of a good sufficiency notion; for if B has nothing to do with A then A can hardly be sufficient for B. But relevance is not of the essence. (More technically, Belnap's weak relevance requirement, that there be no sentential theses of the form A → B where A and B fail to share a variable, is derivable from an inclusion account of entailment which models sufficiency.) The necessity requirement, that has been made much of by relevance and modal fans (cf. ABE), is likewise an outcome of a good sufficiency relation (as RLR again explains).[3]

It should also be remarked that the main early objectives of studies of relevant logics - of which at the usual sentential level ultralogics are special cases - were, firstly, to provide an analysis of entailment and its converse deducibility proper - and of the combination of entailment with other connectives, operators and constants, particularly truth-functional connectives and quantifiers - which met the criteria of relevance and necessity preservation; and, secondly and derivatively, to provide analyses of lawlike implications, i.e. non-necessary conditionals, and also of other conditionals. (The main results of these studies are assembled, or referred to, in ABE.) Ambitions have since vastly expanded, and now encompass relevant or ultralogical analyses of practically all the basic notions occurring in the foundations of mathematics and in the philosophy of science. It is of course in part the way that ultralogical analyses seem to solve problems left open - or created - by classical logic that has encouraged the universality proposal.

Ultralogic is thus being canvassed as universal. But a logic does not have to be universal. A logic (again like a key) can be designed to deal with a special class of cases, as were Łukasiewicz's Ł$_3$ which was to cope with future contingents, Prior's tense logics to handle tenses, and so on (details may be found in [2]). But it is always supposed that these pieces fit into some grander design, e.g. in Prior's case into the larger framework of Russellian logic. In short, there are local logical theories, of this or that, but they do not rule out, but should mesh with, a more general logic.

It may be objected, however, against the ideal of a universal logic, that logics have to be local, that different sorts of situations have different sorts of logics. There is a logic for everyday situations (that's supposed to be classical logic), and there's a logic for microphysical situations (that's quantum logic of some brand), and maybe there's even a logic for impossible situations (that's presumably a dialectical logic). This option gets its extreme formulation in the slogan: 'Every sort of statement has its own sort of logic', which Wisdom (borrowing from Wittgenstein) thought was just part of the idiosyncratic platitude, but really represents an extreme parochialism. This local logics option soon runs into difficulties (as the geographical image suggests) at boundaries, as to how the local logics impinge upon one another and how they combine. For example what happens in a boundary area between two localities? In new (unclassified) situations? If one can't guarantee the location (e.g. because consistency isn't provable)?

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[3] The Kantian character of criteria proposed will not have passed unnoticed. Whereas Kant ([1], p. 27) proposed necessity and universality as sure tests of a priori knowledge and pure reason, universality and logical sufficiency are here being canvassed as conditions of adequacy for a satisfactory deducibility relation.

Moreover some of the apparently local logic positions vanish when pressed into more global logics. For example, quantum and classical logics aren't really just locally related. Quantum logic is supposed to be universal, and classical logic is just a very good approximation, or some such, in classical physical situations.

Then there are some more theoretical difficulties about the local-logic picture. These concern the often remarked generality of logic, its scope of application, supposedly to all reasoning, and the fact that it is not limited by topic (its topic neutrality). How to turn these considerations into a convincing argument against logical parochialism is another matter (with which Haack [4], among others, has struggled). For the difficulties are supposed to turn on the formal features of logic; but progressively new local linguistic features, e.g. tenses, modifiers, adjectives, can be made issues of logical form. And there is no reason why several competing logical theories should not vie for a place, for example, as extending logics to cope with modifiers. These would in a good sense be local theories, but once again theories with the ability to hook onto, and really required to add to, a more general theory.

The local logic theme is sometimes supported by pointing to the range and diversity of logics these days. The argument is supposed to be that logics are just too diverse and heterodox for there to be a single canon of reasoning, or a universal logic. But the argument cannot be correct, as the universal semantics of [51], which organises all logics into a single semantical frame, with one deducibility relation, indicates. And, indeed, all connectives and quantifiers can be encompassed within the scheme of a universal logic of the sort proposed (along the lines of [3]): the trick is once again simply to allow for suitably many non-deductive situations.

The merely-local-logic thesis is likely to be reinforced by some higher powered (and accordingly wasteful) considerations drawn from limitative theorems. Surely a universal logic would have to be complete and finished: but this is an unlikely prospect at best, and limitative "theorems" now assure us that it is impossible (this is effectively Post's assumption and argument; see [34], pp. 395, 417). The short answer to this objection is that a universal logic does not have to be so complete, especially against classical codings into its syntax of semantical paradoxes or their like - indeed there are reasons we will come to for supposing that a universal logic ought to be incomplete, so as to reflect actual truth-value indeterminacy. What is more difficult to meet is the objection that if a logic is to claim to be universal then it should be in principle completable - just as universal science should ultimately and in principle be able to encompass all scientific knowledge. That is a strong requirement, and it does not have to be conceded. It is probably enough for a universal logic that it be applicable to reasoning in every (deductive) situation: again like a key, it provides an organon. There need however be no such retreat: for the limitative results can be escaped, opening the way for completable logics and universal theories (see [59]).

Yet another objection threatens to overwhelm any universal logic project. The objection is that no logic can be universal because situations can always be found which fail to conform to any specific logical principles. But though such non-deductive situations can certainly be found (highly intensional functors will generate them, in terms of what holds where such a functor applies), it does not follow that a universal logic is thereby ruled out. There are two crucial requirements on a universal logic, but jointly they do not imply that a universal logic should apply within non-deductive situations. There is an important distinction between deductive, or logically controlled, situations and non-deductive situations; and the first requirement is that a universal logic should apply to all deductive situations; that is, all deductive situations should conform to the logic. For a deductive situation is one that is closed under deduction, i.e., syntactically, under provable entailment. But it is not the case that any old logic can be made out to be universal by appropriately restricting the class of deductive situations. For this class is independently, and naturally, determined. Inconsistent and paradoxical situations, for example, are commonly deductive situations which conform to requirements of reason; they cannot be arbitrarily, or as a matter of fact, ruled out as non-deductive. The second requirement is that a universal logic should allow for the logic and semantics of functors which determine non-deductive situations; for it should provide a logical framework for all functors. How these functors which pick out non-deductive situations can be dealt with logically is an important issue (taken up again in §4).

§2. *The relevant critique of extant logics, and especially of classical logic.* In brief the critique - which underpins the relevant case for new foundations - is as follows (much fuller, and less dogmatic versions of the critique, which include detailed discussion of positions outside the mainstream classical and modal positions on which I shall concentrate, may be found in ABE, RLR and [5]):- Firstly, these logics do not include an adequate theory of deducibility or its converse, entailment. No account of deducibility which contains the range of paradoxes of implication that the classical metalinguistic account and the corresponding modal systemic account admit, meets even minimal conditions of adequacy for a theory of deducibility. For deducibility as a sufficiency relation demands relevance.

Secondly, as an outcome of the first, these logics simply rule out proper logical examinations of incomplete and inconsistent deductive theories, in particular of non-vacuous incomplete theories where not all logical laws hold and of non-trivial inconsistent theories where some contradictory propositions hold. According to modal logics, of which classical logic is a limiting case, there can be no such theories. A deductive theory is, as a matter of characterisation, closed under entailment. Hence such a theory, if non-vacuous, contains every logical law, by the paradoxical principle that anything implies a logical law; so there can be no such incomplete theories. Similarly by the paradoxical principle that a contradictory pair entail everything, every such inconsistent theory is trivial; so there can be no such inconsistent theories. Yet plainly there are (and shortly we will encounter some), and one can, and sometimes must, reason about these theories deductively.

Thirdly, these logics preclude an adequate logical account of the intensional. For this reason they are philosophically inadequate; and their application to a wide range of problems in the philosophy of science has been (as we will see) disastrous. The success of classical logic in extensional areas, like parts of mathematics, cannot be repeated in the intensional sphere. The reason is that logical study of intensional notions requires the use of incomplete and inconsistent theories; such theories are beyond the reach of even the most liberal classical and modal semantics where all worlds admitted are both theorem-complete and consistent (see [14]). C.I. Lewis's modal treatment of the theory of propositions furnishes a simple example of the inadequacy of mainstream logics when it comes to intensional matters; for according to this theory there is just one necessary proposition and just one impossible proposition. The results of the application of mainstream positions to the logic of information, belief, perception, and so on, are equally appalling (as [6] argues in the case of belief).

Naturally classical theorists have a set of standard replies to such objections - one of the least satisfactory of which is to dismiss our everyday discourse, which is thoroughly intensional, from the purview of logic. It is said to be not really intelligible, or not worth bothering about because unscientific. These are pretty contemptible and easily met objections, but there are more cogent supporting reasons for trying to close out regions such as the intensional where classical logic fails. The sorts of reasons, which of course (circularly) appeal back to classical logic itself, will be familiar from the works of Quine, Goodman and others - intensional paradoxes, and so on. The ploys introduced, classical reshaping and formalising of mathematics, and amending[4] or closing off of areas of discourse to fit its theses, are typical strategems of an entrenched theory. So far these strategems are succeeding remarkably well with the plebs, especially in mathematics, one has to concede. However classical logic can be profitably compared with classical theories of art, e.g. of music; in time classical logic will be seen to be just as restrictive as classical form requirements in music.

It is not just that classical logic and its extensions are inadequate when applied outside the confined region of complete and consistent theories. Fourthly, classical logic and its extensions are plain wrong when so applied. For an integral part of classical logical theories is the rule of material detachment:

(γ) if A and $\sim A \vee B$ are theorems (true) so is B.

For suppose the deductive theory T we are studying is inconsistent but not trivial. Then (γ) wrongly trivialises it. For T, if inconsistent, will include p_0 and also $\sim p_0$ for some formula p_0, and so by (γ) contains B for every B, that is, T is trivial. Nor is it just that we go wrong using (γ) in such cases, because (γ) like a paradox spreads inconsistency everywhere; (γ) cannot be reliably used in studying deductive theories, since these are not generally known to be negation consistent (this point is made in Łukasiewicz [7] and it is elaborated in RLR and [8]). For the general study of deductive theories a non-classical logic will have to be used. And only when consistency is established can (γ) be reliably introduced as an admissible rule: the proper role of (γ) should then be that of a derived rule (like the Cut rule it resembles), which becomes available when negation consistency is appropriately guaranteed. Thus too classical theories whose consistency can not be so guaranteed - and this includes all stronger theories - should be reformulated non-classically. The range in which classical logic can be reliably applied is accordingly very small, and classical logic is not wrong in a merely local way.

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[4] For example, by introducing transparent surrogates for opaque intensional functors.

To sum up, the relevant rejection of other logics is based primarily on the following considerations:- Firstly none of the rivals captures the fundamental logical notion of sufficiency through which deducibility is characterised, and from which other hallmarks of a good entailment relation derive, e.g. relevance, preservation of containment features, and avoidance of suppression of necessary premisses. Secondly, the rivals are wrong and fail to conform to the facts, in particular, all the current rivals as foundational systems go wrong through their treatment of negation and consistency and the resulting incorporation of the rule (γ) of material detachment.

§3. *The choice of foundations, and the ultramodal programme.* To try to show that ultramodal logic is a better choice as a general foundation (i.e. a foundation for all studies, not just mathematics) than classical logic for example, ultramodal logic has to be put through its paces. For it has to be pointed out in detail how ultramodal logic is, overall, a better choice than classical. This intuitive characterisation of the basis of choice of a general foundational logic can be considerably sharpened by way of multiple factor model for the choice of best objective (as expounded in [13]), according to which the best choice maximises on the weighted sum of factor values subject to a set of constraints (a most important constraint being conformity with the facts), and a better choice is one which results in higher values of the constrained weighted sum. One highly weighted factor is scope, the scope of a logic being a matter of the range of situations to which it can apply. A universal logic has maximal scope, but a logic like classical logic has only fairly limited scope. But scope is not the only factor, adequacy to the data is another important factor, and there are several pragmatic factors of non-negligible weight, such as simplicity, intelligibility, fruitfulness in applications, and strength.

A main strategy of the argument for ultramodal foundations will be to argue that ultramodal logic is far ahead of classical logic on scope and adequacy-to-data factors and does not lose out on pragmatic criteria, for a range of reasons; e.g. in the case of simplicity because the set theory furnished is, as a matter of inspection, simpler than classical alternatives (even if proofs, at first, seem harder); with intelligibility because the underlying logic has a classical extensional semantics and so is, formally at least, no less unintelligible than its classical opponent; with fruitfulness and strength because what is correct in classical logic can be represented in it enthymematically.

To make good the initial point that ultramodal logic is far ahead on crucial factors, ultramodal accounts of several critical and representative foundational topics will have to be presented, in substantial detail. And this sets the course for the ultramodal program of research and classical theory replacement.

The big, overarching program is of course to redo things its way, to redo the formalisation of mathematics, the foundations of science, and logical issues in the philosophy of science, in particular, in an appropriately relevant way. Such a program is only in its infancy - relevant sufficiency logic itself is really only 20 years old, but is about to become of age. Moreover the program already faces some embarrassing difficulties;[5] for example, it is embarrassing that Peano-style formulations of "relevant" arithmetic are irrelevant in that any arithmetic identity entails any true arithmetic identity, e.g. 3=5 entails 10=10 (see Meyer [15]). What this means is that a reinvestigation of the Peano postulates for arithmetic in the light of relevant insights is needed. For some of mathematical reasoning may prove to be enthymematic, allowing the positive suppression of necessary truths and negative suppression of logical impossibilities. That mathematics should turn out to contain enthymematic reasoning would not be surprising; mathematicians are often busy men who like to take short-cuts, and commonly prefer mere sketches of proofs to detailed elaboration and verification. However it is always taken for granted nowadays - what often enough proves wrong without the introduction of further postulates - that a full proof could be set out in some appropriate framework. But even if a reconstruction could be done in the framework of strict implication (which allows the sorts of suppression mentioned), this is not good enough according to relevant and ultramodal perceptions: one should in principle go on and work out the larger ultramodal versions which reveal just what logical premisses are being employed and suppressed.

The demand for ultramodal foundations for science and discourse can take stronger or weaker forms. A strong version of the ultramodal position takes the form; the logical foundations ought to be ultramodal, not classical. The presumptive idea is that this upstart, ultralogic, should displace classical logic as underlying logic in the formalisation of scientific theory and of discourse. But there are less ambitious alternative demands, which it would be rash to dismiss. One is simply that ultramodal foundations should be seriously considered as an option, and perhaps held in reserve, just as intuitionistic foundations for mathematics are. After all, ultralogic is on the way to making a critique of classical logic and classical mathematics just as intuitionism has done (hopefully a more cogent criticism). The critiques have several common features: they both focus on the role of negation and, to a lesser extent, disjunction. To be properly considered as options, they should be developed so their features can be seen. Another proposal which can be coupled with the first more modest proposal is that investigation of relevant foundations is a worthwhile activity, viable in its own right. These proposals do not say classical logic ought to be displaced: they probably say that we should look at the options before too dogmatically dismissing alternatives to the classical foundation. They ask that research and education on ultramodal options go on and be encouraged - not dismissed, or persecuted or discriminated against or looked down upon. There is no need for us to adjudicate between these stronger and weaker proposals in most of what follows.

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[5] How many of these can be ascribed to lack of cleverness time may, or may not, tell.

The ultramodal program will include, in the longer term, the following projects:-

1. The ultramodal reconstruction, or better, straightening out, of higher order or untyped logics and of set theory. This plunges us at once into all the issues raised by the logical paradoxes. But other issues that do not arise in the classical case also appear, e.g. the condition on substitutivity of identity, the form of extensionality axioms in set theory, the matter of when a function really does depend on its arguments, and so on. To these issues we will turn, beginning with a quite radical approach to the logical and semantical paradoxes permitted by ultralogic but fairly automatically excluded by all textbook logics. It should be emphasised, however, that the uniform dialectical treatment of logical and semantical paradoxes to be advanced is not one that has to be adopted by exponents of ultramodal or relevant logics; it is simply a very natural alternative that semantics for relevant logics and ultramodal analyses both powerfully suggest.

The diagnosis of the semantical paradoxes, even if hardly pressing for classical mathematics, is an important matter for a comprehensive linguistic theory (cf. Post [16]). Thus a uniform analysis of the paradoxes leads onto a second project:-

2. The design of ultralogical foundations for linguistics. The ultramodal thesis is that textbook logics are unfit to furnish the deep logical structure of natural languages, but that ultralogics should furnish an adequate logical base. The thesis gains further support from ultramodal analysis of intensional functions such as belief, perception and assertion - where once again many modally-induced paradoxes are removed en bloc.

3. Ultramodal - and paradox-free - reanalyses of the main logically investigated topics in the philosophy of science, in particular, probability, lawlike connections, counterfactuals, confirmation, evidence and information. Ultramodal analyses in some of these areas will be sketched out.

4. Ultramodal semantics for such non-transmissible, psychological, functors, as belief, perception, knowledge and assertion, and ultralogical foundations for psychology.

5. Ultramodal formalisation of intuitive, unformalised, mathematics and its parts. This project, like the previous ones, is not without its difficulties. Even the advance to one of the first stages, relevant formulations of arithmetic, has, as remarked,

run into significant problems. And ultramodal analysis is an untouched field. There is no doubt, however, that these fields can be encompassed in ultralogical investigations in one way or another - at worst by invoking appropriate extra assumptions as was done by the logistic program, with such extra axioms as those of infinity and choice - but better by revealing the enthymematic character of modern formalisations of intuitive mathematics. This point may help explain some of the reasons for confidence that ultramodal logic will cope somehow with the formalisation of mathematics.

Recovering the bulk of intuitive mathematics - which is not classical, except insofar as recent classical logical reconstructions have pushed it in that direction - is one thing: establishing the ultramodal adequacy of any such formalisation is quite another and more difficult matter. A first and weakest requirement of adequacy of a formalisation, e.g. of ultramodal analysis, is that of non-triviality, i.e. of absolute consistency. This much the program has in common with Hilbert's program. But, as is widely recognised, non-triviality is no guarantee of correctness, and stronger conditions of adequacy can easily be devised, though verifying that a formalisation meets them may be arduous or impossible. One such requirement is, of course, that of relevance: there should be no theorems of the form A → B, where A is irrelevant to B.

6. Ultramodal reinvestigations of the classical limitative theorems. For it remains at present unclear to what extent these classical results will extend to ultramodal formalisations of mathematics, especially given diagnoses of the semantical paradoxes which fall outside the compass of levels-of-language frameworks.

To reveal, in sharpest form, how unified and thoroughgoing (and, one hopes, penetrating) the ultramodal program is, let us begin with the deeper philosophical issues that motivate the whole program.

§4. *The impact of ultralogic on philosophical problems: ultralogic as a universal paradox solvent.* One of the main negative theses being advanced is that classical logic and its extensions have buggered-up much philosophy, especially philosophy of science, and generated many gratuitous philosophical problems, and that these problems can be resolved using ultralogic. Indeed the obvious or naive solutions to several philosophical problems have been abandoned, and discussion subverted, only because of attachment to classical logic and its offsiders. It is time to try to make good some of these large claims, and to show what ultralogic is good for philosophically. But much of the treatment which follows does not pretend to be other than mainly synoptic (fuller development of these topics is attempted in other publications, in particular RLR and [29]).

Something of the damage wreaked by a bad entailment relation such as some variety of strict implication or its metalogical analogue, L-implication, has been observed, and is documented elsewhere (e.g. ABE and [14]). The damage - which results from modal-type treatments of negation and consistency, and shows up semantically in the restriction to possible situations and consistent models - spills over into many other areas, into the foundations of mathematics and of metalogic, into the theory of propositions, of meaning, of information, of evidence and confirmation, into epistemology, and into ethics and the foundations of value theory. Perhaps, indeed, the implicational paradoxes are the source of all significant philosophical paradox?

A surprising amount of evidence has already been accumulated which makes it tempting to float the general thesis that the cause of a great many, if not all, philosophical paradoxes can be located in the implicational paradoxes. For example, in [30] Goddard develops the provocative thesis that the paradoxes of confirmation derive from the paradoxes of implication. Shortly we shall see the way in which the logical and semantical paradoxes depend on the implicational paradoxes. And elsewhere (especially [14]) it has been shown how the implicational paradoxes generate a wide variety of other philosophical paradoxes.

But while the general thesis comes close to the mark there is a deeper explanation which explains both the implicational paradoxes themselves, the paradoxes that the implicational paradoxes are supposed to explain, and paradoxes, such as the paradox of analysis, that the implicational paradoxes do not appear to explain. This deeper explanation is a semantical one, according to which all these paradoxes are produced through the orthodox restriction of semantical analysis to the possible, and so of the corresponding logical analyses within the confines of the modal. Such is the main thesis of *Beyond of the Possible* [29]. A corollary of this thesis is that a logical theory which penetrates the possibility barrier satisfactorily is going to furnish solutions to a great many philosophical paradoxes.

The detailed argument for the thesis proceeds through a case by case study of philosophical paradoxes and puzzles. However, the essence of the argument in a great many cases takes the following lines:- Every modal functor Φ satisfies the following substitutivity conditions for each of its places: if A is strictly equivalent to B, i.e. in symbols $A \leftrightarrow B$ (or metalinguistically, if $\vdash A \equiv B$) then $\Phi[A]$ iff $\Phi[B]$, where $\Phi[\ ]$ indicates a given place in Φ. But a great many, indeed most, and most philosophically important, intensional functors do not satisfy the condition. Entailment provides but one simple example. Since $A \& {\sim}A$ is strictly equivalent to $B \& {\sim}B$ - no possible worlds can distinguish them - if entailment, $\rightarrow$, were modal $A \& {\sim}A \rightarrow B$ would hold iff $B \& {\sim}B \rightarrow B$ should. But the latter holds, so, on the modal account, $A \& {\sim}A \rightarrow B$ - a familiar paradox. Examples are easily multiplied: if Hegel believed any contradiction he believed every contradiction; if it is desired to prove some necessary truth, it is desired to prove every, or any, necessary truth, and on the modal account a proof of any one would do; if a black raven confirms "all ravens are black" it confirms "All non-black ravens are ravens and not ravens" and vice versa; and so on. To press the point, and at the same time spell out the extraordinary ravens case, it is almost enough to quote Hempel ([48], pp. 11-12):-

> One remarkable consequence of this situation [application of the Nicod criterion combined with logical equivalence conditions] is that every hypothesis to which the criterion is applicable - i.e. every universal conditional - can be stated in a form for which there cannot possibly exist any confirming instances. Thus, e.g., the sentence

> $$(x)\ [\text{Raven}(x)\ \&\ {\sim}\text{Black}(x)\ \supset.\ \text{Raven}(x)\ \&\ {\sim}\text{Raven}(x)]$$
>
> is readily recognised as equivalent to both S_1 and S_2 above [i.e., to both (x)(Raven(x) ⊃ Black(x)) and (x)(~Black (x) ⊃ ~Raven(x))]; yet no object whatever can confirm this sentence, i.e. satisfy both its antecedent and its consequent; for the consequent is contradictory.

Of course when universal conditionals are properly reformulated, with a relevant conditional, this "remarkable consequence" vanishes entirely; for the cited logical equivalence depends crucially on a paradox of implication, A → B ↔. A & ~B → A & ~A, which in turn relies on the paradox A & ~A → B & ~B and, worse, on ~(A & ~B) →. A → B.

In general, so long as the restriction to the possible is insisted upon, as it is classically, there is no way around modal substitutivity conditions and the ensuing intensional paradoxes. But lift the unwarranted restrictions, as ultralogic does, and the paradoxes vanish. Exactly how, a couple of examples will, subsequently, illustrate in detail (see §11). These examples, those of content and of semantic information, have been selected with a view to leading directly into problems in the philosophy of science, in particular to problems concerning probability and confirmation (§12) and thence (§13) problems of quantum logic.

These examples all concentrate however upon only one of the important classes of intensional functors, namely upon transmissible or, as one might almost say, rational functors. A functor Φ is →-transmissible in a given place if whenever A → B then either if Φ[A] then Φ[B] or if Φ[B] then Φ[A]. Functors that are →-transmissible in each place, that is are fully transmissible, yield especially easily to semantical analysis in an entailmental framework which goes out beyond the possible (full details of the analysis many be found in RLR). Also easily catered for within this framework, which allows only for deductive situations, are functors which are either →-transmissible or ↔-transmissible in each place, the logical functors, so to say. Confirmation, preference, and obligation are examples of such logical functors, e.g. if A ↔ B and C ↔ D then if A confirms C then B confirms D.

Contrasted with the logical functors, in good positivist fashion - but of at least as much philosophical interest - are the psychological functors, those such as belief, desire, and knowledge, for which transmissibility fails in one or more places. For the semantical analysis of such functors, inclusion of non-deductive situations is inevitable, and the logical analysis has to be complicated accordingly. How this is done, and how ultralogic deals with the paradoxes which the orthodox logical accounts of psychological functors generate, is explained in detail elsewhere - in the case of belief in [6], for preference and obligation in RLR, and for a comprehensive range of intensional functors in [29]. The emerging ultralogical semantical analyses are not only non-paradoxical, they are more realistic, for they can cope with the beliefs, fears, wishes, knowledge and communication of actual people, as distinct from "ideally rational believers", "epistemically perfect beings", "ideal receivers", and so on, invoked in the interests of maintaining classical and modal paradigms.

The interest in such analyses is not confined to philosophy. It extends to all areas concerned with the program of obtaining a comprehensive theory, including a semantical theory, of natural languages; analyses of intensional functors are a crucial part of any such theory. It extends to areas in psychology concerned with the explanation of highly unorthodox behaviour. And so on.

§5. *A dialectical diagnosis of logical and semantical paradoxes.* The most notorious philosophical paradoxes are no doubt the logical and semantical paradoxes; but it is not difficult to see how the implicational paradoxes - especially the principle, A & ~A → B, of ex falso quodlibet, which spreads any contradiction in a theory so as to trivialise it - magnify the effect of any antinomy, so that logical control is lost. Yet the main classical objection to logical paradoxes just is this loss of control. The orthodox reason for not even considering the option of admitting the logical paradoxes, as what they appear to be, proofs, is given by Hilbert and Ackermann ([17], p. 151):

> It is not possible to tolerate these various contradictions by accepting as a fact the provability of certain mutually contradicting sentences. For as soon as we admit any two mutually contradictory expressions A and $\bar{A}$ as true formulas, the entire calculus becomes meaningless ... .

But this argument depends precisely on the paradoxes of implication. Thus solutions of logical paradoxes are not independent of resolutions of implicational paradoxes. Contradictions need not trivialise a non-classical theory which is free of implicational paradoxes (they do not in any case render a theory absurd or meaningless). All the orthodox argument establishes is that a dialectical set theory cannot be based on a classical logical theory where any contradiction, no matter how isolated, induces triviality through such spread laws as A & ~A → B. A dialectical logic has to be non-classical.

Even without the paradoxes of implication the apparent problem of isolated antinomies of course remains - unless a dialectical position is embraced, and such contradictions are just accepted as part of the theory. Such a dialectical position does however become a live option for anyone charmed by the semantical analysis of relevant logics and of ultramodal functors. For in the semantics one just does look at non-trivial inconsistent and incomplete situations and theories. Sooner or later it occurs to one: maybe the actual situation is one of these: maybe it is inconsistent! And then several reasons for giving serious consideration to this ordinarily-reckoned crazy option begin to emerge, not least of them the arguments for such antinomies as the semantical paradoxes, and the appeal of the ideal of a uniform ultramodal solution of all philosophical paradoxes. Quite apart from this, there is a strong case for a uniform solution for logical and semantical paradoxes, i.e. a single solution which encompasses, with at most variations due to subject matter, the whole range of paradoxes, both known and predicted (the case is presented in [18] and also elsewhere, e.g. [19]). A dialectical diagnosis enables one to offer such a uniform and unified account in a particularly simple way.

A.5 THE UNIFORM DIALECTICAL SOLUTION

The central thesis - other important theses we will come to - of a uniform dialectical solution to both the logical and semantical paradoxes is that there are, as the paradoxes themselves show, some assertions which are overdetermined, and inconsistent, in that both they and their negations are true and other assertions which are underdetermined, and incomplete, in that neither they nor their negations are true. The inconsistent assertion L_0, "This very statement is false", provides an example of overdetermination since both L_0 and $\sim L_0$ are true, and its mate $\tilde{L}_0$, "This very statement is true", provides an example of underdetermination, because without further assumptions neither $\tilde{L}_0$ are $\sim\tilde{L}_0$ is assigned value true (even though $\tilde{L}_0 \vee \sim\tilde{L}_0$ may hold). In short, on this naive dialectical position, the paradoxes are taken to demonstrate that what the semantical defence of relevant logics argues is so at least for remote situations - seemingly that there are both incomplete situations and also inconsistent situations - is not so remote at all and in fact obtains for the actual situation T, where truth is assessed. Thus the world T, construed as everything that is the case, is inconsistent on the singularities the paradoxes provide. There is nothing impossible or absurd about this (as [8], e.g., explains).

There is little doubt but that this dialectical solution offers a uniform "solution" to the whole range of paradoxes, logical or semantical. It simply admits the paradox arguments at face value, as establishing isolated inconsistencies. What it disputes is the usual presupposed logic which spreads the effects of these paradoxes to the rest of discourse. (That is, a thoroughly uniform solution deals both with the full range of logical paradoxes and with the paradoxes of implication.) Given the simplicity of the basic solution it is a straightforward matter to apply it to most paradoxes that arise, e.g. to all those of Prior's family of paradoxes [9]. For example, the man who, unbeknown to himself in room 7, thinks at 6 only that everything thought in room 7 at 6 is false, has only a paradoxical thought; for the content of his thought reduces to the thought that this very thought is false, i.e. to a variant of the liar paradox. The man is undoubtedly thinking, though paradoxically, since his thought is true and its negation is also true. But this paradoxical thought leads to no cataclysmic collapse; it is, exactly as it appears to be, relatively isolated. Indeed we can engage in paradoxical thoughts reflectively without putting the rest of the world out of joint or forging necessary connections with other supposedly separate statements (in the amazing way Prior envisages in [9]).

There is nothing new about a dialectical diagnosis of paradoxes. Aristotle's insistence that 'it is the most true that two contradictory judgements cannot both be true' did not win general acceptance in ancient times. In particular, the dogma was rejected by Heracleitus and by Antistenes, the cynic. Nor were the arguments by which Aristotle supported his consistency dogma by any means conclusive, and some of them were not even persuasive (as Łukasiewicz has demonstrated in [7]). Furthermore there remained outstanding cases of convincing arguments leading to contradictory conclusions, the ancient semantical paradoxes for example. In the early 19th Century Hegel, influenced by Heracleitus, challenged the consistency dogma and traditional logic, and proposed a different logical theory, though one with ancient roots, dialectics, according to which contradictory judgments can jointly hold true. This proposal was absorbed in marxism, and has become fundamental in contemporary marxist philosophy. Precise and detailed logical investigation of dialectical logics was initiated by Jaŝkowski, who (while retaining considerable reservations about the admission of contradictions outside the context of multi-party discussions) was keenly aware of the important role his discussive logic could play in giving a dialectical treatment of paradoxes (see e.g., [36]). Jaŝkowski's researches have been advanced and considerably extended by the work of da Costa (see, e.g., [56]) and his co-workers in Brasil, by Asenjo and Tamburino [50], and by others. But the underlying logics adopted mostly remained, like Jaskowski's systems, excessively strong, and overly intuitionistic, for a natural treatment of the logical paradoxes.

All that is new then is the simple and natural amalgamation of dialectical and relevant insights within the framework of ultralogic.

How the dialectical position manages to get away with its brash central thesis is perhaps best illustrated in detail (as in §6) in the case of the set-theoretical paradoxes; for the basic axioms of the subject are more fully developed and better known than in the case of semantical paradoxes, for instance. But, first, it is important to look at the supplementary theses that can accompany a dialectical resolution. For the dialectical admission of the paradoxes as proofs and as establishing the inconsistency of the full set theory world is, naturally, not the whole story. A dialectical diagnosis of the paradoxes really needs to be filled out by various supplementary theses - in a way that makes it evident how more classical perceptions fit into a dialectical framework.

Firstly, the origin, character and mechanism, so to speak, of the paradoxes still has to be explained, and ideally some guide - it does not have to be effective - provided as to when inconsistency or incompleteness is likely to occur and which regions are safe, in the particular sense of negation consistent. Most of these demands can be met by a theory of content self-dependence (as developed in [18] and briefly sketched in [20], p. 172). The basic idea may be illustrated as follows: the sentence 'This statement is false' is content self-dependent (i.e. its putative content depends on its own content), not in all contexts (e.g. not where 'This statement' refers to some other independent statement), but in self-dependent contexts, i.e. in contexts where 'This statement' refers back just to, depends just on, the intended content of the very sentence in which it occurs. Because of this closed content dependence loop the assertion is content self-dependent in the self-dependence contexts.[6] The closed dependence loop enables a switching of truth-value assignments to occur; for the dependence loop allows the truth-value of a given assertion to be that of its own negation. It allows incompleteness as well as inconsistency, since if the content and truth-value of an assertion depends in the end just on itself then the truth-value of the assertion will never be resolved in other than an arbitrary way.

More complex cases of self-dependence where a chain of dependence relations is involved are explained similarly. For example, in the case of the pair

(1) (2) is true

(2) (1) is false

the content of the second assertion (2) depends on itself though the closed dependence loop goes through (1). And again the self-dependence and resulting endless looping allows an inconsistency producing truth value switch to be imposed.

The dialectical diagnosis can adopt this sort of account of the genesis of the paradoxes without however encountering the usual serious disadvantages of self-dependence or self-reference style accounts which aim to somehow outlaw content self-dependent statements; namely it does not have to pretend, what is far from obvious, that there are effective methods for determining in advance when and where content self-dependence will occur, and, moreover, that the effective methods can be applied if not to rule out just the cases of content self-dependence and not a wide range of other perfectly admissible statements in the formation rules of an ideal language, at least in the axioms of its accompanying logic. But such axioms, most conspicuously in case of set theory, remain to be produced: failure to produce such axioms cannot however be attributed, as in the case of effective formation rules, to the impossibility of the business, but perhaps just to failure of human ingenuity. The dialectical account has the tremendous advantage that it does not have to wait upon the production of such axioms, if they can be devised, but provides a logic and theory in terms of which such axioms may be sought, or their unavailability in suitable form demonstrated.

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[6] Thus, so it is claimed in [20], the sentence lacks content, and is statement-incapable, in these contexts. The same theses, that the paradoxes involve vicious content self-dependence and open reference loops, and accordingly that the paradox-generating sentences involved lack content and fail to yield genuine statements, were developed in [18], [22], and SC. But there are options as to how to state matters where content self-dependence occurs, and the line taken in [18] and [20] is only one of the options. The dialectical position is another, and apparently superior, option, since it does not impose unwarranted limits on the bounds of logical reasoning, and since the statement-incapability option maps into it, that is the main theses of the lacking-content resolution of the paradoxes can be expressed within the dialectical framework.

The content self-dependence resolution - according to which content self-dependent sentences do not have a genuine content, and in the case of indicatives, for example, do not yield statements - has been elaborated (though not to requisite point where logical systems and restrictions emerge) in Mackie's more recent [19]. The content self-dependence resolution is of course but a refinement, an important and needed refinement, of Ryle's namely-rider method - a resolution of the paradoxes which is to be found, in essence, in Meinong.

Before turning to a detailed study of dialectical set theory, there is a further stage in the dialectical process that we should glance at, namely dialectical ascent to, or incorporation of, the metalanguage. In particular, it is instructive to consider the way in which the dialectical solution can deal with the commonly presented informal sketches of Gödel's theorems. Consider a variant on Kleene's argument ([26], p.205), which is but a simplification of Gödel's original informal argument ([24], p.598). It is assumed, firstly, that one can find, by diagonalisation, a constant assertion A which says of itself, in the metalanguage, that it is not provable, i.e.

A ↔ ~Prov A (1).

This takes up in part Kleene's first premiss, that A means that A is unprovable; for if A means this then it certainly implies it, and vice versa. Kleene's second assumption is the correctness assumption that false formulae are unprovable,

False A → ~Prov A (2).

or as Gödel puts it, taking it that what is not false is true, provable assertions are true, i.e. for every B, Prov B → True B, or, as both Kleene and Gödel assume in their arguments, and as follows using the elimination principle, True B → B,

Prov B → B (2').

Now let us assume, thirdly, that not only does (1) hold but also, what substitution in (1) would provide were it permissible,

~A ↔ ~Prov ~A (3).

Classically such an assertion A cannot be obtained, without disaster, any more than a truth predicate can be defined for rich languages, but dialectically such an A is quite admissible: it is simply demonstrably inconsistent, as both it and its negation are true. The argument is as follows:-

1.	Prov A → ~Prov A	from (1) and (2')
2.	~Prov A	from 1 by DL principles
3.	A	by 2 and (1)
4.	Prov A ↔ ~Prov ~A	by (3) and (1)
5.	Prov ~A	by 2 and 4
6.	~A	from (3) and 5
7.	A & ~A	3 and 6.

Even without (3) the dialectical conclusion should not be the standard one, that A is undecidable but true - though it can be. For ~Prov A but A as above, and, assuming (2') generally, B → ~Prov ~B, whence ~Prov ~A. But (2') causes distortion dialectically in cases where both D and ~D are true and one is provable, in virtue of its consistency outcome B → ~Prov ~B; for then Prov D and ~Prov D - the inconsistency spreads to the proof-theoretic apparatus. What is correct, and avoids this spread, is the rule form of (2'): Prov B ⇾ B. Then however undecidability vanishes: there is nothing to prevent ~A's being true and provable (cf. for more detail [59]).

Truth as well as provability is, naturally, dialectically expressible, and will presumably satisfy the general condition

True B ≡ B (4),

though not necessarily its implicational strengthening

True B ↔ B (5).

Now by paradox arguments an assertion C can be found such that C ↔ ~True C, whence C & ~C. Thus truth is expressible at the cost, on the dialectical picture, of isolated contradictions. The dialectical picture allows, then, for both classically admissible content self-dependence which leads classically to undecidability and classically inadmissible content self-dependence which leads to inconsistency. And this is as it should be: both sorts of cases are out of the same box, and should be admitted, or rejected, together.

To adopt, however, a dialectical metalanguage as well as (or together with) a dialectical object language is to venture on to more slippery ground than will be attempted in the sections that follow. For given the vanishing theory of truth, as expressed by (5), and the law of non-contradiction, ~(A & ~A), both Aristotle's and Hegel's theses emerge. But these theses - respectively, "for no assertion A is both A and ~A true", and "for some assertion B, both B and ~B are true" - are usually regarded as totally antithetical. That they should both hold in a strong dialectical metalanguage is merely a reflection, by way of (5), of the object theses, ~(A & ~A) together with the thesis, for some B, B & ~B, of dialectical logic.

Ascent to a dialectical metalanguage emphasizes that there are two stages in a more complete switch from classical to dialectical positions, and that it can be important pedagogically (and in order to keep one's feet on the ground) to separate the stages. The first is the switch to a dialectical logic, where the semantical metalanguage is kept classical. In [8] and in most of this paper only this switch is attempted. The second, and eventually required, conversion is that of the semantical metalanguage to a dialectical one. The second stage is required for a full dialectical assessment of limitative theorems, and also, to take a simple example, for dialectical evaluation of the vanishing truth principle, given the inclusion in orthodox relevant logics of the law of non-contradiction ~(A & ~A). If (5) is incorporated then the two positions which stand in dialectical contrast at the first stage, the Aristotelian and the Hegelian positions, are synthesized. While the synthesis has its appeal, there are good reasons for avoiding it, for dropping (5) and making the truth connective do some proper work, not vanishing.

§6. *Dialectical set theory*. A dialectical set theory is one which accepts the paradoxes of set theory as part of the theory; it is a theory on which the underdeterminacy and overdeterminacy induced by the paradox-generating items of the set-theoretical paradoxes is simply admitted and the paradox arguments are taken as proofs; it is a theory according to which the Russell class, for example, the class of all those classes which are not self-membered, both does and also does not belong to itself, and thus is perforce an inconsistent theory. But the hope (which can be vindicated under certain conditions) is that it is not a trivial theory on which not just the Russell paradox, but everything, holds.

A dialectical set theory, then, meets the paradoxes head-on, taking the paradox arguments as proofs and the contradictory conclusions as holding in the theory. That this approach has hardly ever been considered in modern discussions of the options open in the foundations of mathematics (or, if considered, quickly dismissed as crazy or, more restrainedly, as absurd or incoherent) is, once again, because it cannot be admitted classically.

To take the apparently radical - but in fact commonsense - position that some sets (or multiplicities, if you like) are inconsistent and just do involve contradictions, one need not, however, embrace contradictions as true. By suggesting that such a position would admit contradictions as true, Hilbert and Ackermann ([17], p.151) obliterate a most important distinction, namely that between theories that are simply considered and those that are taken as true. A theory can be investigated logically without being taken to be true; indeed it may be known to be false. For logical investigation of dialectical theory to get under way it is enough to have it conceded - what surely ought to be conceded - that there are non-trivial inconsistent theories, and that set theory may be one of these. But - according to the more orthodox option open here - since contradictions hold in the theory, the theory cannot be true, the world of set theory must be different from the actual world. In what follows this option, that unreconstructed set theory is a non-trivial inconsistent and false theory, will not be ruled out.

But there is a more exciting option, the thorough-going dialectical position, according to which unreconstituted set theory is an inconsistent but nonetheless true theory. Set theory as originally developed by Cantor is such a theory, and Cantor can be construed as taking it as such a theory, as I shall try to bring out. Subsequent set theories, starting with Russell and Zermelo, have all been attempts to consistencize in one way or another the inconsistent, but still thoroughly appealing, Cantorian theory, by dropping apparently true statements from the theory, e.g. one or other or both of the statements that the Russell class R belongs to itself and that R does not belong to itself.[7] The dialectical position is however that there is nothing wrong with the original unformalised Cantorian theory: disaster only occurred with the formalisation of theory which underpinned it with classical logic and thus trivialised it.

Cantor's set theory is not alone in being a promising candidate for an inconsistent but correct theory. As we have observed, if empirical facts are unfavourable so that the conditions for various semantical paradoxes are satisfied then ordinary discourse (considered as a theory) is inconsistent (e.g. the statements of the policeman and the prisoner in one of Prior's family of paradoxes [9] really do generate contradiction). Once again, as with the logical paradoxes, there are many ways - only a few of them worked out in any detail at all - of rendering discourse consistent - each of them deleting or making inexpressible apparent truths.

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[7] Meyer's way of consistencizing a theory (in [60]) through a converse Lindenbaum lemma illustrates a more general method of separating out a crucial consistent part of an inconsistent theory.

The thoroughgoing dialectical position - unlike the more orthodox option (which is however hardly a comfortable position in the case of semantical paradoxes), has the shocking consequences of making the world (considered as everything that is the case) inconsistent and of making contradictions possible, since what is true is possible. As argued in [8], a metaphysical position that does these shocking things cannot be automatically ruled out. The consistency of the world, when one thinks about it, is not at all easy, and perhaps impossible, to establish in a non-question begging way. The objection, for example, that if this were so contradictions would be possible - but they are not, begs the question by conflating two senses of 'possible', namely entailing a contradiction, and being realisable, which a careful dialectician would distinguish. Good arguments in favour of the consistency assumption, as distinct from prejudice, are hard to come by.

Perhaps, but why choose a dialectical theory for the paradoxes? The reasons are as before. A first major reason for going dialectical is this:- Logical reasoning does not simply cut out when one lands in a paradoxical situation - as one easily may: just consider again some of the families of paradox Prior [9] discusses. Nor does catastrophic breakdown occur as the classical account presumes (so the classical view might well be called the catastrophe view of inconsistency and paradox). For example, the policeman-prisoner paradoxical situation could occur (with the policeman saying that everything the prisoner says is false and otherwise making only independently verifiable true statements while the prisoner simply says that whatever the policeman says is true), yet courtroom procedure would most likely go on much as before. And the logical paradoxes are far more remote. Certainly even if there were some breakdown in a real life paradoxical situation it would generally be isolated and insulated from most other matters. But, whatever the limited breakdown, if any, reasoning would not come to a sudden halt. On the contrary, it has to be applied to spell out the consequences drawn in the paradoxes from the often unsurprising (at least to the uninitiated) premisses.

It is not just that we want to apply logical principles in the region surrounding the paradoxes, the paradoxes themselves being out of logical bounds or taboo. It is that we want to apply logical principles to, and right inside, the paradoxes. Just as we want to be able to reason in and find our way about logically inconsistent situations, so likewise in the case of paradoxical situations. Even inside the paradoxes, in paradoxical situations, we can continue to reason. These situations have a logic - but it is severely non-classical - and they have a logic it would be desirable to determine logically. This cannot be done if paradoxical situations remain a prohibited area. Thus any proposed resolution of the paradoxes which aims to get them out of the way before logic can apply will be insufficiently general; a satisfactory resolution should enable the study of paradoxicalness and the workings of the paradoxes by logical techniques. These points tell particularly against type-theoretic blockings of logical paradoxes and levels-of-language strictures.

These are not of course the only reasons for favouring a dialectical theory. The paradoxes would not be paradoxes were there not a convincing, appealing or even compelling case for the assumptions they involve. In the case of the logical paradoxes the arguments are not just those of an inconsistent logical theory; they derive from assumptions which are commonly thought to be true (in common parlance logical paradoxes are "true contradictions"). This is especially so in the case of the comprehension scheme for set characterisation, which appears to be the main source of a striking array of set-theoretical paradoxes. For a comprehension principle is built into the meaning of set.

Going dialectical is only a part of the paradoxical story. Another part consists in distinguishing the various everyday notions of set that have been conflated with set in the pure abstract sense (characterised by comprehension and extensionality); and yet another major part lies in providing the mechanisms of the paradoxes. Both the latter and the matter of determining the non-paradoxical sets can be done, I believe, through a theory of loops. In the case of paradoxical sets there is always some assertion where there is no end to looping. Both dialectical options indicated require supplementation by some account which marks out the non-paradoxical sets, but the matter is more critical with the weaker option which should be able to go on to say what is correct. In the stronger option this only amounts to working out what is non-paradoxically true, on the various consistent cut-downs— which may not be taken to be of such great or immediate moment.

Let us simplify matters, this time in a conventional manner, by restricting considerations to first-order set theories, that is to set theories formed by adding to quantificational logic only constant predicates concerned with sets themselves, e.g., ϵ, $=$, M (for 'is a set' or 'is a multiplicity'), E (for 'is an ensemble' or 'is a consistent multiplicity'). The theory will of course always include ϵ and be able to define $=$. A simple (first-order) dialectical set theory DST will accordingly comprise some non-classical quantificational logic with at least a conventional set of connectives $\{\&, \vee, \sim, \rightarrow\}$ and universal and particular quantifiers, U and P, with denumerable stocks of subject variables and perhaps constants, and with some predicate constants including ϵ. The formation rules of DST will be like those for other first-order set theories. The postulates of DST will be those of its non-classical quantificational logic together with some characteristic set-theoretic postulates constraining the predicate constants.

The critical issue - which reflects back on the choice of the quantificational logic - concerns the shape of the set theoretic axioms, particularly the versions of comprehension and extensionality adopted. Let us consider comprehension first. DST does not seek to avoid the paradoxes, so it does not need to write in the usual restrictions on comprehension designed to secure consistency. On the contrary, DST aims to incorporate the paradoxes and the reasoning involved in them. Indeed, as a further condition of adequacy, DST has to be able to establish that the Russell class R both belongs to itself and not, i.e. $R \in R \& \sim(R \in R)$. The argument for this relies on an application of the comprehension axiom of the form

$$(x)(Pw)(x \in w \text{ iff } \sim(x \in x)),$$

a form ruled out on all going set theories except ideal or naive set theory. The immediately suggested idea, which has tempted many, is: if such forms are admitted why not the original comprehension axiom of ideal set theory itself? After all no one has been able to find anything very convincing wrong with the comprehension axiom, except things bound up with the paradoxes themselves. But DST is already committed to admitting the paradoxes, so why restrict comprehension at all?

But it is, of course, no convincing argument for the comprehension axiom that no one really has anything against it - except paradoxes - and that the naive form is still bought fairly generally in workaday mathematics and in everyday reasoning. The axiom may nonetheless have to be faulted because it trivialises, and even a dialectician is going to be forced to restrict comprehension if he makes the mistake of adopting an over-restrictive sentential logic. No, the appeals to ordinary unrestricted usage of comprehension in set formation are persuasive, because they reflect the fact that set formation is not limited by any restrictions at all. Every condition - whether intensional, paradoxical, or whatever - determines a set through a comprehension principle.

Accordingly the next adequacy requirement imposed is that DST admit an unrestricted comprehension axiom, namely

$$(x)(Pw)(x \in w \leftrightarrow A) \qquad \text{(GCA)}$$

where $\leftrightarrow$ is the iff connective of DSL (which is here taken as defined $B \leftrightarrow C =_{Df} (B \rightarrow C) \& (C \rightarrow B))$ and A is any well-formed expression of DST.

The comprehension axiom is a general one (whence the label GCA) because it does not impose the familiar restriction, that w should not be free in A, that even naive set theories often adopt. Removing this substitutional restriction opens the way for the formation of further inconsistent sets, e.g. most simply, a set Z with the property that

$x \in Z \leftrightarrow \sim x \in Z$, upon writing $\sim x \in Z$ for A in GCA.

Z, unlike R, is a completely bizarre set, everything belonging to it iff it does not, whereas very many sets do not belong to R without also belonging, namely all those that are straightforwardly non-self-membered such as the set of all integers, the set of all purple items, all concrete objects, etc. If the dialectician is going to tolerate some inconsistent sets isolated further inconsistent sets might as well be admitted as well, especially if there are reasons and advantages in doing so. In this case there are. A major uniformity in set determination can be achieved, through the derivation of such postulates as the axiom of choice from GCA, as we shall see. It may be objected that with the GCA we lose the constructive character of set generation that the CA provides, with sets always eliminable through their characterising condition - whereas Z for example is deliberately characterised in terms of itself. But this constructive character of CA was always a myth, and the paradoxes show that eliminability fails (in cases where looping occurs). Constructive generation of sets from some initially given base leads to theories of constructive sets in the vicinity of (not necessarily coinciding with) Zermelo's set theory. It does not accord with the usual or Cantorean view of sets - as given. If sets are all out there, in Aussersein, as they seem to be, then any constructive aspect vanishes. A GCA provides a general, and legitimate, method of picking them out. Finally there is of course no reason why we should not, within the theory, distinguish sets by their method of generation just as we may distinguish consistent and inconsistent sets; thus, e.g. we might distinguish CA sets from those like choice sets that use GCA, we might distinguish constructive sets, and so on.

Some fairly severe constraints on the character of the non-classical logic of DST are already imposed by the conditions of adequacy adopted. For example, the requirement that the Russell paradox $R \in R \mathbin{\&} {\sim}(R \in R)$ be derivable requires U-instantiation, and enough principles to guarantee the inference from $R \in R \leftrightarrow {\sim}(R \in R)$ to $R \in R \mathbin{\&} {\sim}(R \in R)$, the set I shall adopt being the sufficiency conditions: Identity ($A \rightarrow A$), Simplification ($A \mathbin{\&} B \rightarrow A$, $A \mathbin{\&} B \rightarrow B$), Modus Ponens ($A, A \rightarrow B \Rightarrow B$), Adjunction ($A, B \Rightarrow A \mathbin{\&} B$), Excluded Middle ($A \vee {\sim}A$) and $\vee$-Composition ($A \rightarrow C \mathbin{\&} B \rightarrow C \rightarrow .\ A \vee B \rightarrow C$). This set is of course chosen with several ulterior motives, one of them being the retention of a single universal logic. Then the argument proceeds as follows:-

1.	$R \in R \rightarrow {\sim}(R \in R)$	Simplification
2.	${\sim}(R \in R) \rightarrow R \in R$	
3.	$R \in R \rightarrow R \in R$	Identity
4.	$R \in R \vee {\sim}(R \in R) \rightarrow .\ R \in R$	by 2, 3, $\vee$-Composition, and rules
5.	$R \in R$	4, Excluded Middle
6.	${\sim}(R \in R) \rightarrow {\sim}(R \in R)$	Identity
7.	$R \in R \vee {\sim}(R \in R) \rightarrow {\sim}(R \in R)$	, as for 4
8.	${\sim}(R \in R)$	, as for 5
9.	$R \in R \mathbin{\&} {\sim}(R \in R)$	, Adjunction.

The most controversial of these principles is very likely Excluded Middle: its adoption in DST is only the first of many features that serve to distinguish the dialectical approach from a many-valued approach to set theory. Adoption of Excluded Middle in this framework is tantamount to adoption of a rule form of Reduction, viz. $A \rightarrow {\sim}A \Rightarrow {\sim}A$ and, given Contraposition, of Counterexample, viz. $A \rightarrow B \Rightarrow {\sim}A \vee B$. The many-valued alternative, against which I shall argue, though accepting $R \in R \leftrightarrow {\sim}(R \in R)$ rejects $R \in R \mathbin{\&} {\sim}(R \in R)$, the separation being effected by the abandonment of Reductio principles and Excluded Middle. But the question, as to whether R belongs to itself or not, is (as argued elsewhere, e.g. SC, [20]) a perfectly significant one; and the trouble is not that the truth-value of $R \in R$ is indeterminate - the trouble is that it is overdetermined, so that both $R \in R$ and ${\sim}(R \in R)$ should, on quite compelling intuitive grounds, get assigned value true. Dialectically abandonment of Excluded Middle is the wrong option. Dualising the principles so far adopted takes us well on the way to the logical principles we shall eventually and tentatively adopt for DST.

Much more sentential logic is quickly ruled out than is easily ruled in. (This is of course the trade-off we depend upon - a strong non-trivial set theory by way of weak sentential principles which don't wipe out reasoning within and through the paradoxes.) Firstly, as we have observed all the paradoxes which spread contradictions about go, e.g. $A \to.\ {\sim}A \to B$, ${\sim}A \,\&\, A \to B$, and so on. They're no-gooders which we'd want to get rid of on other grounds anyway, though doing so already makes the theory severely non-classical. More disconcerting classically however is the elimination of the rule γ of material detachment. But it is bound to go. By the dual of Simplification, namely Addition, ${\sim}(R \in R) \vee \mathrm{Bad}$; so, were γ to hold, Bad would ensue, for arbitrary Bad, i.e. γ would trivialise DST. (The dialectical case against γ is set out in DL: γ holds at best for consistent theories.)

The rejections are not disconcerting just for the classically-oriented. The philosopher who is beginning to be charmed by one of the "standard" systems of relevant logic, of ABE, will perhaps be alarmed, if not by the disappearance of Contraction $A \to (A \to B) \to.\ A \to B$, at least by the rejection of its mate Assertion, $A \,\&\, (A \to B) \to B$. Assertion would trivialise DST because it leads to a rule form of Contraction, and this rule form enables a proof of triviality through the Curry paradox argument,[8] as follows:-

$(Pw)(x)(x \in w \leftrightarrow.\ x \in x \to \mathrm{Bad})$ by CA.

Let us call such a w, C; the quantificational principles of DST should be chosen to permit this procedure. Then

$(x)(x \in C \leftrightarrow.\ x \in x \to \mathrm{Bad})$; so

$C \in C \leftrightarrow.\ C \in C \to \mathrm{Bad}$, by Instantiation.

Thus $C \in C \to.\ C \in C \to \mathrm{Bad}$ and

$C \in C \to \mathrm{Bad} \to.\ C \in C$, upon simplifying.

By Rule Contraction, $C \in C \to \mathrm{Bad}$, whence $C \in C$, so Bad ensues. Rule Contraction is obtained in this way:

$A \to (A \to B) \Rightarrow A \,\&\, A \to.\ A \,\&\, (A \to B)$, by the dual of $\vee$-Composition,

$\Rightarrow A \to B$, using Tautology $(A \to.\ A \,\&\, A)$,

Rule Syllogism $(A \to B,\ B \to C \Rightarrow A \to C)$, and Assertion. Rule Syllogism (already adopted earlier) we'd be extremely reluctant to give up (for reasons set out in RLR), Tautology we're committed to by the dual of

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[8] This trivialisation was first observed by Meyer.

∨-Composition and Identity, so Assertion has to give. But there are in fact appealing reasons drawn from investigations of semantical paradoxes, for thinking that Assertion - which is quite different from the rule of Modus Ponens - is a pretty dubious customer once paradoxical situations are admitted. This is best brought out semantically: Assertion would exclude situations, of the type which occur with semantical paradoxes, where $A \rightarrow B$ and A both hold but B fails to hold, that is, where an implication which holds is also counterexampled.

The rejection of Contraction principles eliminates not only standard relevant logics but all logics based on positive logic - in particular, Jaśkowski's system and da Costa's C_n systems $(1 \leqslant n \leqslant w)$, all of which were specifically fashioned to study, in one way or another, systemic inconsistency (see, e.g., [35] and [36]).

The remaining considerations determining choice of a relevant working logic to underpin dialectical set-theory have been semantical ones, with two exceptions. In particular, the Affixing rules adopted have been chosen with a view to ensuring simple semantical modellings with a 3-place relation R defined on worlds (or situations); for without their adoption a more complex relation on worlds and sets of worlds would be required. And simplicity of modelling is important in attempting to establish results concerning DST, such as absolute consistency. But nothing much of importance hangs on the Affixing rules, and were they to become essentially involved in the derivation of underivable results they could be abandoned without excessive hardship. Likewise in the case of the remaining quantificational schemes, just enough to retain a simple rigid semantics and theses required for a completeness argument has been included. The exceptions lie in the strengthenings to theorem form of the rules of Syllogism and Contraposition. Both schemes are correct and belong to the basic system DL (of [8]). Conjunctive Syllogism, $(A \rightarrow B) \ \& \ (B \rightarrow C) \rightarrow . \ A \rightarrow C$, does however introduce a modelling condition it would be preferable to do without; but its use is required in the expected development of DST.

The resulting quantification logic DKQ, with ∨ and P defined operators, is as follows:-

$A \rightarrow A$

$A \ \& \ B \rightarrow B$

$A \ \& \ (B \vee C) \rightarrow . \ (A \ \& \ B) \vee C$

$\sim\sim A \rightarrow A$

$A \vee \sim A$

$(x)A \rightarrow A(t/x)$

$(x)(A \vee B) \rightarrow . \ A \vee (x)B$, with x not free in A.

$A, \ A \rightarrow B \Rightarrow B$

$A \rightarrow B, \ C \rightarrow D \Rightarrow B \rightarrow C \rightarrow . \ A \rightarrow D$

$A \ \& \ B \rightarrow A$

$(A \rightarrow B) \ \& \ (A \rightarrow C) \rightarrow . \ A \rightarrow B \ \& \ C$

$(A \rightarrow B) \ \& \ (B \rightarrow C) \rightarrow . \ A \rightarrow C$

$A \rightarrow \sim B \rightarrow . \ B \rightarrow \sim A$

$(x)(A \rightarrow B) \rightarrow . \ A \rightarrow (x)B$, with x not free in A.

$A, \ B \Rightarrow A \ \& \ B$

$A \Rightarrow (x)A$

The sentential logic DK of DKQ differs from system DL only in weakening Counterexample, $A \ \& \ B \rightarrow \sim(A \rightarrow \sim B)$, to rule form, that is, in effect, to $A \vee \sim A$.

The first degree structure of DKQ, that is to say of the system of wff which contain no nested occurrences of the implication $\to$, is exactly that of such better known relevant systems as EQ and RQ. The comparative loss of strength of DKQ is where it ought not to matter so much for formalising intuitive arguments, in iterated implicational principles. Note too that all but the principles for implication of DKQ are essentially classical: unlike most proposals for antinomic logics in the literature, negation satisfies all forms of double negation, contraposition, and non-contradiction.

The applied system DST results by adding to DKQ the general comprehension scheme GCA and an axiom of extensionality. Evidently for but a little care in the choice of sentential axioms a great saving in set theoretical superstructure has been achieved.

DKQ is not a finitely-valued logic: there are no finite characteristic matrices for the sentential part of DKQ (of which the quantificational part is a conservative extension). This important fact separates the dialectical approach from many-valued approaches to the set-theoretical paradoxes, but it is not the critical separation point. The critical separation point which equally separates DST from infinite-valued approaches, e.g. those based on Łukasiewicz infinite-valued logic L_∞, is the treatment of over-determined cases. The usual non-standard logic approach has been to treat over-determined cases like under-determined cases, the truth-teller platitude like the Liar (or false-teller) paradox, the anti-Russell class $\check{R}$ (of all those classes which are self-membered) like the Russell class, and so on. This is wrong. There is a symmetry between over-determined, or inconsistent, and under-determined, or incomplete, cases but they do not reduce to one another. (This is also a reason why significance-style solutions are mistaken, though not the main reason.)

A theory like DST which mirrors the actual situation will, then, be both inconsistent and incomplete. It will not assign a truth-value to $\check{R} \in \check{R}$ for example, though it could of course easily be extended to do so. That is not to say that $\check{R} \in \check{R}$ does not have a truth-value - by bivalence in the actual world, T, $\check{R} \in \check{R}$ is either true or false - but nothing in the theory, like nothing in ordinary intuitive considerations, determines which, so it seems.

§7. *The problem of extensionality and of relevant identity.* To determine DST it remains to specify the form of the extensionality axiom for sets. The form of this axiom raises an awkward problem not just for DST but for intensional set theory generally. The problem can usefully be broken down into two subproblems.

The first problem is how to formulate the presumably analytic claim

A. Sets with the same elements are identical. This claim is the standard way of taking up the thesis that sets are determined by their elements (which is what supposedly distinguishes sets from properties). Claim A can be transformed, without too much dispute, to the determinable form

A1. If $(x)(x \in w$ iff $x \in v)$ then w is identical with v, $w=v$ for short. The question is how to fill out the determinables 'iff' 'if ... then' and '=' with appropriate determinates (on this method of resolving disagreements into choice of determinates for agreed determinables, see SC, chapter 4). Some resolutions of determinables are obviously unsatisfactory in an intensional framework, e.g. the classical formulation

$$(x)(x \in w \equiv x \in v) \supset. w=v;$$

for though w and v may coincide everywhere in the actual situation, they may well differ in situations beyond the actual; so their element coincidence would at best guarantee an extensional (contingent) identity, and certainly not an identity of the sort required for intersubstitutivity of the kind "extensionality" axioms demand. This trouble can be avoided by strengthening the material equivalence to a coentailment, which ensures coincidence through all worlds considered. Within a relevant dialectical framework, where material detachment is not available, the most promising resulting forms are

A2. $(x)(x \in w \leftrightarrow x \in v) \rightarrow. w=v$, and

A3. $(x)(x \in w \leftrightarrow x \in v) \mathrel{\rightarrow\!\!\!\circ}. w=v.$

The way the identity determinable, =, is to be resolved takes us to the main problem, the characterisation of identity relevantly - and also intensionally - and the question

B. Within what frames are identicals interchangeable?

The answer conventionally assumed in set theory is: within all frames. Thus results the determinable form:

B1. if $w=v$ then $A(w)$ iff $A(v)$.

If, however, the determinables are resolved in the expected way so that B1 becomes

B2. $w=v \rightarrow. A(w) \leftrightarrow A(v)$

then serious problems ensue: Firstly, irrelevance. This results immediately from B2 by vacuous substitution. Thus $w=v \rightarrow. p \rightarrow p$ for arbitrary wff p, e.g. $2 + 2 = 4$ entails that GCA implies itself. Not only is this irrelevant in an obvious sense, that antecedent and consequent have little or nothing to do with one another, but further the antecedent is insufficient for the consequent; and evidently an arbitrary arithmetic identity is not sufficient on its own for all instances of the law of identity. To say that it is is nothing but a restricted paradox of implication. The problem cannot be escaped simply by prohibiting vacuous substitutions; for, as both Bacon and Dunn have observed, since $B \leftrightarrow. B \,\&\, (B \vee A(w))$, cases of vacuous substitutions can be quickly derived from cases of non-vacuous substitution. B2 will have to be more drastically modified to avoid irrelevance. (The situation with regard to orthodox entailmentally strengthened identity theory in the framework of stronger relevant logics is even worse. For there it can be shown that any identity entails any logical truth.) Secondly, there are familiar problems of opacity where highly intensional frames are admitted into the language (see, e.g., Quine [10] for the problems, and for the treatment of the problems SC, chapter 7). This latter problem is not avoided, but only shifted, by different resolutions of the determinables of B1. In the absence of comprehension principles both problems are however avoided (as Urquhart first saw) by replacing B1 and B2 by the initial forms from which inductive arguments for them begin, namely:

B3. $w=v$ only if $w \in z$ iff $v \in z$ and

B4. $w=v \rightarrow.\ w \in z \leftrightarrow v \in z$.

Within a weak relevance framework there are, in fact, two resolutions of B2 which are promising,

B5. $w=v \rightarrow.\ w \in z \rightarrow v \in z$ or, what is deductively equivalent,

$w=v \rightarrow.\ (z)(w \in z \rightarrow v \in z)$, and the corresponding rule form

B6. $w=v \rightarrowtriangle (z)(w \in z \rightarrow v \in z)$.

And B2 is not recoverable from B5 by inductive argument since the relevant logics being considered all lack the principle of Factor (e.g. $A \rightarrow B \rightarrow.\ C \& A \rightarrow C \& B$).

It would be rash to pretend however that this avoidance of the problems by moving back to primitive or atomic forms is philosophically satisfactory: since from a natural language point of view any predicate, including highly opaque predicates, can be taken as primitive, the move involves an unfortunate logical atomism. And when general comprehension principles are added the unsatisfactoriness of this atomic fix becomes formally transparent. For consider an arbitrary wff $A(w)$ containing w free. By the comprehension principles for some set z, say z_1, $w \in z_1 \rightarrow A(w)$, for every w, including v. So B3 yields B2 by quantificational principles. The upshot is: general comprehension and extensionality principles cannot be combined without sacrificing relevance.

The conflict between comprehension and extensionality is part of a general quandary for relevance logics that is quite independent of logical paradoxes, namely that substitution or, what are closely connected, comprehension principles cannot be relevantly coupled with Leibnitz identity, or extensionality principles. The problem occurs even for second order quantified relevant logics where logical paradoxes are of course no threat.

Of the three possible ways out of this quandary, qualify Leibnitz identity, qualify comprehension (or substitution), and qualify both, the second is ruled out given quite weak relevant quantificational principles, as the earlier argument to identity irrelevance reveals. The damaging effect of extensionality principles is readily shown, e.g. by the following argument:

Since $p \leftrightarrow q \rightarrow.\ f(p) \rightarrow f(q)$, by extensionality,
$p \leftrightarrow q \rightarrow.\ r \rightarrow r$, taking $f(p)$ as constant r.

So, as $p \to p \to. p \leftrightarrow p$, $p \to p \to. r \to r$. That is, total irrelevance follows from extensionality. Nor is the matter rectified by the simple expedient of excluding vacuous substitution. For vacuous substitution can be reintroduced by the back door given the mere exclusion of vacuous substitution, as the earlier argument for identity irrelevance revealed. Just how damaging extensionality principles can be is brought out, unintentionally, by Church in [11], where classical sentential logic is derived, from otherwise largely innocuous postulates by way of extensionality.

The Belnap-Meyer strategy has been to try to qualify both extensionality and comprehension, the main proposal so far being that these principles operate only where (sentential) functions depend relevantly on their arguments. Thus in both $w=u \to. A(w) \to A(u)$ and $(Pz)(w)(w \in z \leftrightarrow A(w))$ it is required that $A(w)$ depends relevantly on (or really is a function of) w. For example, constant functions (such as t in the sentential case) do not so depend on their arguments. But the notion of relevant dependence so far lacks a satisfactory explication; all that has been offered in the case of identity is the unsatisfactory atomic scheme B5 already considered (starting from which dependence is defined inductively in the obvious way which corresponds to inductive recovery of a qualified B2).

If, however, extensionality has to be qualified anyway - and there is no independent case for qualifying comprehension - a better course (also recommended, for what it is worth, by the minimum mutilation principle) is to qualify extensionality alone, and thus to reject the Leibnitzian account of identity. As to how this is to be done the form of the content identity principle in the sentential case gives a good clue. This coimplication substitutivity principle takes the rule form:

$$A \leftrightarrow B \Rightarrow D(A) \to D(B) \ :$$

strengthening it to entailment strength (with an arrow replacing the rule connection) generates irrelevance.[9] Proceeding analogously in the set theoretical case leads to B6,

$$w=v \Rightarrow w \in z \to v \in z \qquad \text{(Ext. R)}.$$

In the case of set theory the problem as to how to guarantee the appropriate properties of intensional identity is easily solved: simply define (as in standard set theories)

$$(D=)\ w=v =_{Df} (x)(x \in w \leftrightarrow x \in v)\ ,$$

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[9] There are other options to consider, the most important being the form: $A \leftrightarrow B \,\&\, D(A) \to D(B)$. There are reasons for having serious reservations about this principle - reasons based on a consideration of its inductive proof. Firstly, the inductive base $A \,\&\, (A \to B) \,\&\, (B \to A) \to B$ seems to depend for its proof and truth on the rejected Assertion principle. Secondly, the inductive step for negation would require the use of Antilogism: $A \,\&\, B \to C \to. A \,\&\, {\sim}C \to {\sim}B$, which is an immediate source of paradox and of Disjunctive Syllogism.

i.e. use A2 and its converse to characterise set identity.[10] It is immediate from the definition, using quantificational principles, that identity, =, is reflexive, symmetric and transitive.[11] These properties are used in turn in establishing, by induction, the general replacement rule:

$w=v \rightarrow A(w) \rightarrow A(v)$,

where A(w) is any wff and A(v) results from A(w) by replacing v by w at one or more places, provided no occurrence of w is in the scope of quantifiers binding w or v.

(Ext. R), together with (D=), completes the weak axiomatisation of DST. The weak axiomatisation appears, however, to be too weak for some relevantly acceptable set-theoretic arguments, e.g. for some of those used below in arguing for the axiom of choice. The problem is that the rule form of extensionality does not capture all that was correct in the traditional formulation. A better approximation to what was right classically can be obtained (as so often) enthymematically using constant t. Then the extensionality principle becomes:

$u=w \ \& \ t \rightarrow . \ u \in z \rightarrow w \in z.$ (t-ed Ext)

It follows by induction (since a t-form of factor holds, namely $A \rightarrow B \ \& \ t \rightarrow . \ A \ \& \ C \rightarrow B \ \& \ C$):

$u=w \ \& \ t \rightarrow . \ A(u) \rightarrow A(w)$, with appropriate quantificational qualifications. Since t is a theorem (Ext. R) follows at once; but irrelevance is seemingly avoided, since the extra t occurring in premisses is uneliminable.

To adopt this enthymematic approach to extensionality requires the addition of constant t to the underlying logic DLQ. But t - which is interpreted as the conjunction of all theorems, and semantically marks out the class of logically regular worlds - can be added conservatively to DLQ through the two-way rule: $A \Leftrightarrow t \rightarrow A$. Constant t is worth getting to know. It has already played an important role in the algebraic study of relevant logic, and it may have a significant part in the properly relevant formulations of arithmetic and analysis.

But t-ed extensionality can in turn be improved upon. A superior form of extensionality - which can be gleaned from the corrected form of Factor, namely $A \leftrightarrow B \ \& \ C \leftrightarrow C \rightarrow . \ A \ \& \ C \leftrightarrow B \ \& \ C$ - is

$u = w \ \& \ z = z \rightarrow . \ u \in z \rightarrow w \in z$ (Ext).

This form, suggested by Brady, is stronger than t-ed Ext.

System DST proper has Ext as its final postulate.

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[10] The question arises as to how to interpret (D=) where w and v are not sets, but are, e.g., individuals. One possibility (Quine's idea for his system ML) is to interpret 'ϵ' as identity in such cases so that (D=) reduces to a form of $w=v \leftrightarrow . \ (x)(x=w \leftrightarrow x=v)$. A more interesting possibility is to interpret 'ϵ' as a part relation - so that w=v iff all parts of w and v everywhere coincide - since this opens the way for a neat amalgamation of set theory and mereology (a suggestion developed in Brady [12]).

[11] Proof of transitivity uses Conjunctive Syllogism.

§8. *The development of dialectical set theory; reconstructing Cantor's theory of sets.* Given comprehension and extensionality schemes it is an easy matter to develop most of the main features of classical set theory and extant descriptive set theory. The central postulates of Zermelo-Fraenkel (ZF) and von Neumann-Bernays-Gödel (NBG) set theories are readily derived - in intensional form - as a few illustrations will emphasize. Consider first a version of the familiar pairing axiom

(P) $(Pz)(u)(u \in z \leftrightarrow. u=x \vee u=y)$.

This is an instance of GCA, and appropriate uniqueness of the pair set z so guaranteed follows from extensionality. For if $(u)(u \in z_1 \leftrightarrow. u=x \vee u=y)$ and $(u)(u \in z_2 \leftrightarrow. u=x \vee u=y)$ then $(u)(u \in z_1 \leftrightarrow u \in z_2)$, so by (Ext. R), $z_1=z_2$. Consider next the null set axiom:

(N) $(Pz)(u)(u \in z \leftrightarrow. \sim(u=u))$,

again an instance of CA. Rule extensionality ensures that the set provided is appropriately unique. Call it, as usual, Λ. It follows that $(u) \sim u \in \Lambda$, as required. For its complement, V, defined as $\bar{\Lambda}$, $(u)(u \in V)$. CA of course guarantees an unrestricted complement for each set x, through

(C) $(Px)(u)(u \in z \leftrightarrow \sim(u \in x))$.

As a final example consider the power set axiom

(W) $(Pz)(u)(u \in z \leftrightarrow u \subseteq x)$,

where $u \subseteq x =_{Df} (y)(y \in u \leftrightarrow y \in x)$. Note that $\subseteq$ has the requisite partial order properties and is properly related to $=$. However $\subseteq$ differs significantly from the usual inclusion notion in that it does not follow that $\Lambda \subseteq x$: the usual inclusion of the null set in every set depends on a paradox of formal implication. But a different definition of Λ will yield $\Lambda \subseteq x$.

What is perhaps not quite so obvious is that DST furnishes important but more controversial axioms of set theory and settles major questions standard theories leave open. In particular, it delivers not only the axiom of infinity, but, more originally, the axiom of choice. Furthermore it puts us on the way to regaining the proof Cantor thought he had of the continuum hypothesis. Let us consider these issues in turn.

(1) The axiom of choice. The standard relations between versions of the axiom of choice and its conventional equivalents, such as well-ordering principles, maximal principles, etc.,[12] become problematic in an intensional framework. However several central, but perhaps non-equivalent forms follow in DST; just one example will be given. The derivation of all the forms depends crucially on GCA and the fact that the set variable, for the introduced set, may appear free in the set characterising formula.

AC1. There is a function f such that for every non-null set y, $f`y$ belongs to y; in precisifying symbols:

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[12] The extraordinary variety of extensionally equivalent forms are set out in Rubin and Rubin [52].

$(Pf)\ (\mathrm{fnc}(f)\ \&\ (y)((Pz)(z \in y)\ \&\ t \rightarrow f^{\iota}y \in y))$. Define a function as a univocal relation or a null one.

Consider the following thesis supplied by GCA:

$$\text{(i)}\quad (Pf)(x)(x \in f \leftrightarrow.\ (Pu', v')(x=\langle u', v'\rangle\ \&\ v' \in u')\ \&\ \mathrm{fnc}(f)).$$

For such an f, $(Px)(x \in f) \rightarrow \mathrm{fnc}(f)$. But also, $\sim(Px)(x \in f) \rightarrow \mathrm{fnc}(f)$, since, by definition, if f is null it is a function. (The usual definition includes this case automatically, again by virtue of paradox.) Hence fnc(f), and also $t \rightarrow \mathrm{fnc}(f)$. Now

$$\text{(ii)}\quad \mathrm{fnc}(f)\ \&\ (Pz)(z \in y) \rightarrow yf(f^{\iota}y)\ ;$$

this can be made a matter of characterisation of $f^{\iota}y$. Hence

$$\text{(iii)}\quad (Pz)(z \in y)\ \&\ t \rightarrow (\langle y, f^{\iota}y \quad \in f)\ \&\ t\ .$$

To simplify (i) appropriately one further background detail is needed, namely

$$\langle u, v\rangle = \langle u', v'\rangle \leftrightarrow.\ u=u'\ \&\ v=v'\ .$$

Then, it follows from (i)

$$(u, v)\ .\ \langle u, v\rangle \in f\ \&\ t \rightarrow.\ v \in u\ ;$$

so

$$\text{(iv)}\quad \langle y, f^{\iota}y\rangle \in f\ \&\ t \rightarrow f^{\iota}y \in y\ .$$

Thus by (iii) and (iv) $(y)((Px)(z \in y)\ \&\ t \rightarrow f^{\iota}y \in y)$, as required.

(2) *Inconsistent and consistent sets*. Just as there is nothing new about the idea of a dialectical set theory on its own, so there is nothing new about the inconsistent sets that such a theory will generate. The distinction between inconsistent and consistent multiplicities, aggregates or classes, dates back at least to Schröder ([54], p. 213) who, before the dark era of the logical paradoxes, marked out a set as consistent when its elements are compatible, and as inconsistent otherwise. Cantor's important distinction is more complex. On his initial account in his letters to Dedekind ([24], p. 114) an inconsistent multiplicity is one

> such that the assumption that *all* its elements "are together" leads to a contradiction, so that it is impossible to conceive of the multiplicity as a unity, as "one finished thing". ... If on the other hand the totality of the elements of a multiplicity can be thought of without contradiction as "being together", so that they can be gathered together into "one thing", I call it a *consistent multiplicity* or a "set".

Cantor's characterisation is hard to come to grips with formally,[13] since many of the notions used do not figure in elementary class theory, and since it is unclear from the larger context whether the contradictions of inconsistent multiplicities are merely hypothetical ones or are genuine, that is to say whether inconsistent multiplicities really are inconsistent in some respect. The classical interpretation, for which there is some textual support, is the hypothetical one: inconsistent multiplicities, though definite, are not really inconsistent. This leaves much to be explained that Cantor never explains, in particular as to how the comprehension axiom is to be restricted so that inconsistent multiplicities remain at most hypothetically inconsistent, and which multiplicities are consistent. It is worth exploring an alternative dialectical interpretation where none of this explaining is needed.

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[13] There are, however, several valuable leads in the literature. Firstly, Cantor's inconsistent multiplicities are strikingly similar to Russell's self-reproductive classes, classes which once formed generate further elements beyond, but not beyond, the class:

> ... there are some properties such that, given any class of terms all having such a property, we can always define a new term also having the property in question. Hence we can never collect all the terms having the said property into a whole; because whenever we hope to have them all, the collection which we have immediately proceeds to generate a new term also having the said property ([55], p. 36).

Russell goes on to claim that this provides the general form of all known class paradoxes, and that these paradoxes all belong to logic and are (only) to be solved by some change in current logical assumptions. He then considers three alternative changes in the comprehension principle designed to exclude self-reproductive classes, neglecting entirely the dialectical option of modifying other going logical assumptions. All Cantor's examples of inconsistent multiplicities are, or are intended to be, of the self-reproductive variety, but he does not aim to exclude them, and the most Russell has shown is that we cannot collect the elements of such classes into consistent wholes. Consider Cantor's first example, the "totality of everything thinkable". When this class is formed, or comprehended, it provides a further thinkable, which would not (Cantor must have supposed) belong to the initially formed class of thinkables and yet, with the comprehension of the class does belong to itself. Sethood, as ensured by the comprehension axiom, leads through self-reproduction to inconsistent properties.

Another important lead is provided by Ackermann's attempt [57] to decode Cantor's definition of 'set' and to build a set theory from the result. Ackermann's set theory can be seen as one way of determining precisely conditions on consistent sets, the predicate 'M', that is a distinctive feature of his system, reading: is a consistent multiplicity.

The central idea (see footnote 13) is that some sets are inconsistent because, when comprehension is applied, they turn out to have inconsistent properties. Thus, where x is a multiplicity, x is directly inconsistent iff $(Px)(x \in z \mathbin{\&} x \notin z)$. But this definition does not, on its own, ensure that x is a multiplicity. By making use of extensionality, a superior definition, which implies multiplicity in the sense of having members, results:

x is d-inconsistent $=_{Df}$ $(Pz)(z \in x \mathbin{\&} z \notin x)$.

Then the Russell set, R, is d-inconsistent, since $R \in R$ and $R \notin R$. Similarly presumably, by paradox arguments, the sets consisting of all cardinals and of all ordinals are both d-inconsistent.

But direct inconsistency is insufficiently comprehensive. For if a set has an inconsistent part or an inconsistent element then presumably it is inconsistent in virtue of that. Cantor wants, in fact, to go further and to count a set as inconsistent if it can even be put into 1-1 correspondence with an inconsistent set. What needs to be guaranteed by appropriate definitions, then, are the postulates:

x is d-inconsistent $\rightarrow$ I(x), i.e. x is inconsistent;

$I(x) \mathbin{\&} (x \in y \vee x \subset y) \rightarrow I(y)$.

(only the membership case causes a definitional problem, requiring introduction of the $\in$-ancestral.) It follows that the set U of all sets is inconsistent, since it has R as a part, and, what is more disputable, that the sets {R}, {{R}}, ..., are all inconsistent.

It is evident however that the important but laborious task of seeing what can, and, equally important, what cannot, be accomplished in DST lies, for the most part, ahead. What has been presented is but a small beginning in that enterprise.

§9. *Ultramodal mathematics: arithmetic.* In order to sustain the ultramodal challenge to classical logic it will have to be shown that even though leading features of classical logic and theories have been rejected, one can still get by. In particular, it will have to be shown that by going ultramodal one does not lose great chunks of the modern mathematical megalopolis. The strong ultramodal claim - not so far vindicated - is the expectedly brash one: we can do everything you can do, only better, and we can do more. More, because there are whole mathematical cities that have been closed off and partially abandoned because of the outbreak of isolated contradictions, notably theories of the very small, infinitesimals, and theories of the very large, Cantor's set theory. Admittedly there have been modern restorations of apparently consistent suburbs of these theories, but the life of these cities has vanished and they have become like modern restorations of ancient cities, like modern Balbus or Leptis Magna, mostly just patched-up ruins visited by tourists.

The question of the recovery of modern mathematics, or for that matter of classically-derivable mathematics, is not so far a very precise one, because there are different notions of recovery. In one sense, that of a liberal postulate theory, where any requisite postulates for a topic may be pressed into service, the whole of exactly-formulated modern mathematics is rather trivially obtainable simply by throwing on the requisite postulates. Since classical sentential logic is obtainable in this way, just by adding the paradox postulate $A \rightarrow. B \rightarrow A$, it is immediate that any theory that can be represented by classical postulate theory (as explained, e.g. in Church [23]) can be obtained in ultramodal postulate theory as well. But the procedure, of adding on sufficiently many further postulates, may lead to infringements of other prized properties, such as consistency, relevance, and so on. It may be that such a postulational recovery is the best that can be achieved for some mathematical theories, e.g., those that are shot through with irrelevance. But at least in the case of central mathematical theories, such as arithmetic and number theory, the ultramodal objective is to establish stronger types of recovery.

There are two sorts of relevant recovery of especial interest in the case of arithmetic, namely recovery within ultramodal set theory, and recovery, as far as possible, in a first order framework. The first sort is deeper, since it provides an analysis of arithmetic notions; but it is also a larger and more vexed enterprise - because many of the moves in classical set-theoretical reductions of arithmetic fail relevantly, because it presupposes much more, as the non-triviality of arithmetic comes to depend on the non-triviality of the underlying set theory, and because all the controversial and questionable features of ultramodal set theory get imported into arithmetic. But such a set-theoretic analysis is nonetheless important, since it should furnish a guide to the correctness of the principles assumed in the second sort of recovery, namely in first order relevant arithmetic. Once again, however, there is a stronger type of recovery to consider, that is to say a type of enthymematic recovery for classical first order Peano arithmetic formulated with material implication, $\supset$, as the entailment relation.

To establish such classical recovery in the case of arithmetic (which provides an important working example) there are two problems of independent interest. The first is the question of a properly entailmental axiomatisation of arithmetic, since the usual Peano postulates are unsatisfactory. The second matter, the main issue in practically every case involving enthymematic recovery, is whether the rule γ is derivable for ultramodal arithmetic. Proof of γ requires, in effect, a soundness and completeness result, and so includes a consistency proof. In particular, a proof of γ for ultramodal arithmetic would not merely establish the consistency of classical arithmetic, should it be consistent; it would also help circumscribe Gödel's second theorem.

Consider the problem of the proper axiomatisation of arithmetic first. Peano arithmetic reformulated with entailmental relations occupying the main implicational positions leads at once to results of dubious entailmental validity, such as:

$3 = 3 \rightarrow 19 = 19$,

$19 = 19 \rightarrow 1 = 1$,

$3 = 5 \rightarrow 9 = 9$, and, more generally,

(a) $m=m \leftrightarrow n=n$, and

(b) $t=n \rightarrow m=m$.

None of these are correct entailmental principles, I want to claim, yet they are almost immediate given correct identity principles (symmetry and transitivity) from the Peano postulates:

Pα. $n=n \rightarrow .\ n+1 = n+1$

(or $Nx \rightarrow .\ x=x \rightarrow x' = x'$, if the domain is not restricted to natural numbers) and

Pβ. $n+1 = n+1 \rightarrow .\ n=n$.

Proposition (a) follows from these two postulates by transitivity of identity using the fact that any natural number m may be represented as the m^{th} successor of zero, and then (b) follows from (a) since $t=n \rightarrow n=t$, whence $t=n \rightarrow (n=t)\ \&\ (t=n)$, and $t=n \rightarrow .\ n=n$. But propositions (a) and (b) are subject-restricted paradoxes. For according to (a) any correct numerical equation entails any other while (b) guarantees that any logical false equation with a numerical term entails any true numerical equation. And in Meyer's arithmetic (system R# of [15]) these results spread to more extensive paradoxes, such as that any correct numerical equation entails any theorem of arithmetic.[14]

Attempts to prove Pα and the more general form

Pαγ $n=n \rightarrow .\ n+m = n+m$

to which it leads within the framework of a relevant set theory suggest the requisite modifications to these principles. Just as the principle of Factor:

$p \leftrightarrow q \rightarrow .\ p\ \&\ r \leftrightarrow q\ \&\ r$

is corrected within the relevant framework here adopted through the principle

$p \leftrightarrow q\ \&\ r \leftrightarrow r \rightarrow .\ p\ \&\ r \leftrightarrow q\ \&\ r$,

so Pαγ is corrected by reinstating a suppressed, because obviously correct, premiss $m=m$, giving

$n=n\ \&\ m=m \rightarrow .\ n+m = n+m$.

Similarly Pα is corrected to

Pα'. $n=n\ \&\ 1=1 \rightarrow .\ n+1 = n+1$.

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[14] There are other significant anomalies in R#. For example, there are puzzling discrepancies between the strength of addition and subtraction principles on the one hand and those of multiplication and division on the other. Thus while subtraction principles, such as $m+3 = n+3 \rightarrow m=n$, hold in entailmental form in R#, corresponding cancellation principles, such as $m\text{X}3 = n\text{X}3 \rightarrow m=n$ do not.

The Peano principle Pβ may be similarly corrected if first recast as $n=n \to n\dot{-}1 = n\dot{-}1$, a correct form being

Pβ'. $n=n \;\&\; 1=1 \to.\; n\dot{-}1 = n\dot{-}1$

The formal arithmetic DKA that emerges after these corrections adds to quantificational logic DKQ, formulated with 0, +, X, ' (i.e. zero, addition, multiplication and succession) as non-logical constants (and minus specifically contradictory axioms), the following non-logical axioms:

A1. $x=y \;\&\; \tau \to.\; x' = y'$

A2. $x' = y' \;\&\; \tau \to.\; x=y$

A3. $x=y \;\&\; y=z \to.\; y=z$

A4. $x=y \to y=x$

A5. $x' \neq 0$

A6. $x+0 = x$

A7. $x+y' = (x+y)'$

A8. $x \text{ X } 0 = 0$

A9. $x \text{ X } y' = (x \text{ X } y) + x$

and the following induction rule:

RMI $A(0),\; A(x) \to A(x') \Rightarrow A(x)$,

where $\tau =_{Df} 1=1$, $1 =_{Df} 0'$, and $t \neq u =_{Df} \sim(t=u)$.

These arithmetic axioms may of course be equally well added to quantified relevant logics other than DKA, e.g. to system RQ, yielding an arithmetic RA. RA differs from Meyer's arithmetic R# (of [15]), which simply adopts arrow reformulations of the usual first order Peano axioms, in just the following respects:-

(i) the R# axiom $x=y \leftrightarrow x' = y'$ is replaced by A1 and A2;

(ii) the R# axiom $x=y \to.\; x=z \to y=z$ is replaced by A3 and A4.

If DKA is formulated with constant t, where t satisfies, as usual, the rule $A \leftrightarrow t \to A$, then since $\vdash t \to \tau$, A1 and A2 yield the enthymematic forms $x=y \supset x' = y'$ and $x' = y' \supset x=y$, where $\supset$ is the intuitionist-like implication defined by $A \supset B =_{Df} A \;\&\; t \to B$.

Whereas R# has been extensively investigated, there is much work to be done on DKA. Several mappings connecting R# and classical arithmetic are known, with the result that it is easily established, relying on classical results, that many classical theorems hold relevantly, that all recursive relations are expressible in R#, and accordingly, given the classical mythology (on which see Meyer [15]), that Gödel's first theorem holds for R#. Whether these results hold for DKA is not known; in particular, it is not known whether or not every recursive relation is expressible in DKA. Research thus far has been concentrated on establishing the admissibility of γ for DKA, as this would settle in one blow a great many such open questions; but definitive results are still lacking.

§10. *Another question of adequacy: consistency arguments.* Though DST deliberately rejects an orthodox criterion of adequacy for a theory, namely negation consistency, it does not escape all consistency-style checks on adequacy. In particular, it would hardly be a satisfactory theory if it were trivial, if every assertion were a thesis. Similarly ultramodal arithmetic would be a worthless theory were it trivial, and even if non-trivial it would be decidedly unsatisfactory if it enabled the proof of arithmetically incorrect assertions such as $0=1$ or $0 \neq 0$.

The consistency of ultramodal arithmetic is not in doubt, and not simply because it is a sub-system of classical arithmetic. There is an elementary non-triviality proof for ultramodal arithmetic which at the same time shows that the incorrect equations $0=1$ and $0 \neq 0$ are not theorems.[15] The position with respect to DST is less clearcut, but there are, however, partial results, which show essentially that DST is non-trivial provided that the implication symbol, $\rightarrow$, does not occur in the right-hand side of the general comprehension axiom. Obviously this is a severe restriction on the fecundity of the theory, and research aimed at removing the restriction is proceeding. Meanwhile it is worth reporting partial results.

In both consistency arguments - that for arithmetic and that for dialectical set theory - the matrices of 3-valued system RM3, interpreted dialectically, will be appealed to (RM3 is discussed in ABE). Where $\sim$, & and $\rightarrow$ are primitive (with $\vee$ is defined as usual: $A \vee B =_{Df} \sim(\sim A \,\&\, \sim B)$) the requisite matrices of RM3 are these:-

&	t	n	f	~
t	t	n	f	f
n	n	n	f	n
f	f	f	f	t

→	t	n	f
t	t	f	f
n	t	n	f
f	t	t	t

Where the matrix values are given arithmetic significance, namely t, n and f are identified respectively with +1, 0 and -1, the value of $A \,\&\, B$ is the minimum of the values of A and B (similarly $\vee$ takes the maximum of component values), the value of $\sim A$ is the inverse of the value of A, i.e. $v(\sim A) = -v(A)$, and the value of $A \rightarrow B$ is the maximum of $-v(A)$ and $v(B)$ when $v(A) \leqslant v(B)$ and the minimum of $-v(A)$ and $v(B)$ when $v(A) > v(B)$.

The matrix for $\leftrightarrow$, defined $A \leftrightarrow B =_{Df} (A \rightarrow B) \,\&\, (B \rightarrow A)$, is also needed: it has value f for non-diagonal elements and value t for diagonal elements except when both A and B have value n in which case $v(A \leftrightarrow B) = n$.

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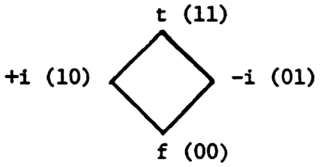
[15] This finitary proof is a simple adaptation of an important elementary proof found by Meyer; as Meyer argues in [15] the proof is enough to undermine all the philosophical applications that have been made of Gödel's second theorem, and to imperil the scope of the theorem as well.

The matrices for &, v and ~ are precisely those for Łukasiewicz's system $Ł_3$. RM3 differs from $Ł_3$ however in taking both t and n as designated values (that is, it is a C-system in the sense of SC). The explanation as to why n is designated lies in the intended dialectical interpretation of n as both true and false. Thus if A has value n then A is true: it may also be false, but since true it should be designated in the same say as when A has value t.

The quantifiers U and P of the quantificational extension RM3Q of RM3 behave like infinite conjunctions and disjunctions respectively, with (Ux)A(x)[(Px)A(x)] taking the minimum [maximum] value of the arithmetic values assigned to A(x). More precisely, for a given assignment to the free variables other than x of A(x), v((Ux)A(x))= t iff v(A(x)) = t for every assignment of values to x; v((Ux)A(x)) = f iff v(A(x)) = f for some assignment of values of x; and v((Ux)A(x)) = n otherwise.

There is an appealing intuitive case for favouring 4-valued matrices, which allow for incompleteness as well as inconsistency, rather than 3-valued matrices for the consistency arguments. Then n - which so far can either be interpreted as a neuter value, or as an underdetermined value, -i, or as an overdetermined value, +i - would split into the two values, +i and -i, with +i construed as both true and false, i.e. {t, f} and -i construed as neither true nor false, i.e.Λ. The matrices for connectives &, v, ~ may be computed piecewise from the Hasse diagram:



where the 4-element lattice is represented, as shown, as a product of two 2-element Boolean algebras. It follows that conjunction and disjunction are again given as minimum and maximum values, and negation has the matrix:

$$\begin{array}{c|cccc} \sim & t & +i & -i & f \\ \hline & f & +i & -i & t \end{array}.$$

These matrices play an important part in the theory of entailment (see e.g. ABE, p. 161 ff.) and the whole semantical analysis of entailment can be built upon them. But while the arguments which follow can be carried through in terms of these 4-valued matrices, the fourth indeterminary value is not so far needed; simpler 3-valued arguments suffice.

The integers modulo 2 provide the domain for the model in Meyer's consistency proof for relevant arithmetic. For the proof which follows - which unlike Meyer's proof refutes 0≠0 - the domain is given by the sequence:-

(S) 0, 1, 2, 1, 2, 1, 2, ... ,

where $1=0'$ and $2=0''$.[16] In short, the elements are those of $\{0, 1, 2\}$, with 1 the successor of 0 and 2, and 2 the successor of 1. Matrix-values are assigned to the atomic wff, numerical equations, as follows: $v(0=0) = t$, each of $1=1$, $2=2$, $0=2$, and $2=0$ is assigned value n, while $1=2$, $2=1$, $0=1$, $1=0$ are assigned value f, i.e. incorrect numerical equations have value f while correct equations - according to (S) - are assigned either value t or n. The values of complex wff are then determined through the RM3Q modelling given, with operations determined faithfully, i.e. $v(x+y) = v(x)+v(y)$, $v(x \times y) = v(x) \times v(y)$ and $v(x') = (v(x))'$ for operations in sequence (S). It follows at once that $v(0\neq 0) = v(0=1) = f$. The modelling likewise refutes every other incorrect numerical equation. But every theorem of DKA and of RA is assigned a designated value, that is, where B is a theorem of DKA, $v(B) = t$ or $v(B) = n$, by induction on the proof of B. For it is a matter of direct verification that each axiom takes a designated value and that the rules preserve designated values.

Theorem. Neither $0\neq 0$ or $1=0$ is a theorem of DKA (or of RA); hence DKA is absolutely consistent.

Since the proof of consistency is a finitary one it can presumably be represented in DKA itself. Thus DKA, like R#, escapes Gödel's second theorem. Furthermore, these results for relevant arithmetics, if they do not refute outright, certainly cast serious doubt on, Gödel's sweeping claim ([24], p. 616)[17] that

> ... it can be proved rigorously that in every consistent formal system that contains a certain amount of finitary number theory there exist undecidable arithmetic propositions and that, moreover, the consistency of any such system cannot be proved in the system.

For by 'consistency' Gödel means absolute consistency (see [24], p. 614, footnote 63), and by 'contains a certain amount of finitary number theory' he appears to mean that every recursive relation be expressible

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[16] In both classical arithmetic and Meyer's R# if one could prove both A and ~A for some A one would be able to prove $0\neq 0$, i.e. negation consistency is tantamount to the refutability of $0\neq 0$. In each case this is due to paradoxical features of the arithmetic. In DKA however negation consistency is not deductively equivalent to the refutability of any incorrect numerical equation or inequation.

[17] This is by no means the only respect in which Gödel's claim is too sweeping. There are no rigorous proofs without assumptions, and Gödelian-style proofs of incompleteness and undecidability make rather large, and unstated, assumptions about what is admissible in the metalanguage in terms of which the proofs of incompleteness are carried out. Without these assumptions the proofs fail. In particular, if all content self-dependence is outlawed in genuine statements - including of course that induced through translations such as Gödel numbering - as would be done by a thorough-going uniform resolution of paradoxes, then the standard assumptions do fail; see [25].

(cf. [24], p. 617); yet R# meets Gödel's conditions, and permits demonstrations of its own consistency. In fact a reading of the fine print of Gödel's 'Postscriptum' ([34], p. 73) reveals that Gödel's only warrant for his sweeping claim is the much more limited result established by Hilbert and Bernays for classical arithmetic. Gödel's assurance, that 'the proof carries over almost literally to any system containing, among its axioms and rules of inference, the axioms and rules of inference of number theory', appears to be quite unwarranted.

A fuller understanding of the scope and status of Gödel's consistency theorem awaits, however, the outcome of investigations as to the admissibility of rule γ of material detachment in relevant arithmetics. For if γ is admissible in, i.e. is a derived rule of, some appropriate relevant arithmetic UA, then UA will include classical first order arithmetic on direct translation, and will in fact be a non-trivial recurisvely axiomatisable extension of classical arithmetic. On all standard accounts[18] the non-triviality of UA cannot be proved from the postulates of UA; but it can be. A proof of γ would also be important in other ways; it would provide an adequacy result of a sort for UA, through showing that UA contained at least as much number theory as classical first-order arithmetic; and moreover it would furnish a new consistency proof for classical arithmetic.

Another important open question, along with the admissibility of γ for relevant arithmetic, is the issue of the non-triviality of DST. The best results that have been obtained so far in this direction can be summed up as föllows:-

Theorem. Where LQ is any quantificational logic included in RM3Q, then the set theory obtained by adding to LQ the general comprehension axiom, GCA, subject to the proviso that the implication symbol arrow does not occur on the right-hand side of GCA, and the extensionality rule, Ext. R, is non-trivial.

This theorem, obtained by elaborating the persistence results of Brady [12] and [28], falls short of the desired non-triviality result for DST in two respects: less seriously in the weakened form of extensionality, and more seriously in the exclusion of formulae built up using → from set determination in GCA. The latter restriction, effectively to extensionally determined sets, is undesirable: there is no reason why sets should not be intensionally specified, and indeed they commonly are essentially so specified. There is some promise that, by combining use of the 3-valued matrices with world semantics for DKQ, that is by treating each world in a 3-valued fashion and applying persistence methods with respect to each world, the restriction on GCA in the non-triviality theorem can be lifted. Contrary to popular assumption, the impossibility of such a non-triviality result has not been demonstrated by Gödel's second theorem: as in the case of relevant arithmetic, so with DST, we are beyond the bounds of the validity of Gödel's famous claim - indeed dialectical set theories are not seriously hampered by Gödel's first theorem either.

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[18] For example, Shoenfield [26], p. 213;

> The general conclusion is that if an axiom system contains as much number theory as P then one cannot prove the consistency of that axiom system from the axioms of that system.

It might be thought that Shoenfield's argument accordingly showed that γ is inadmissible for any UA. But it does not because the argument given turns on classical features, such as the conflation of absolute and negation consistency, and, more important, demands the admissibility of γ for every recursive extension of UA, a most unlikely assumption.

That is where the ultramodal program in the foundations of mathematics stands, and that is where we shall leave that part of the program and turn to explications of more philosophical concern.

§11. *Content and semantic information.* The qualitative theory of semantic information is based on the analysis of content. But the classical theory of logical content, as worked out in most detail by Carnap [31], is shot through with paradoxical results, e.g. all necessary truths have the same content, namely none, and likewise all logical falsehoods have the same logical content. These paradoxes are of course derivative from the account of entailment, explicated as L-implication, which Carnap presupposes; that is, the paradoxes are derivative from the underlying paradoxes of strict implication, which in turn depend on the limitation to state descriptions or possible states-of-affairs. By changing the semantical base, but preserving essentially the classical definitions of content Carnap uses, and their intuitive bases, all these paradoxes can be avoided. (The account which follows is an enlargement of that in [14] to deal with higher degree formulae and also with quantified formula, i.e. the restriction to truth-functional formulae is removed. The account in [58] can be similarly enlarged.)

A condition of adequacy on any account of logical content, or information, is that it leads to the results that A entails B iff (the meaning of) B is included in the meaning of A, and (the meaning of) B is included in the meaning of A iff the content of A includes the content of B.

Part of the argument for this condition is simply this:- Whenever A entails B, A asserts all that is asserted or meant by B and perhaps more. Conversely, when A asserts all that is asserted by B, the meaning of B is included in the meaning of A, so A entails B. Now symbolising 'the content of A' by 'c(A)', part of the condition is secured by defining: (the meaning of) B is included in the meaning of A as $c(B) \subseteq c(A)$ - provided only that 'c(A)' can be defined in turn so that contents can be appropriately ordered by an inclusion relation. But, by the semantics for entailment (in a typical model), $A \rightarrow B$ iff for every (deductive) situation a if A holds in a then (materially) B holds in a, i.e., canonically, iff for every a if B is not in a then A is not in a; i.e. iff $\{a: B \text{ is not in } a\} \subseteq \{a: A \text{ is not in } a\}$.

Comparison of this equivalence with

$$A \rightarrow B \text{ iff } c(B) \subseteq c(A)$$

reveals that all the desired features follow if we connect

$c(A)$ with $\{a: A \text{ does not hold in } a\}$,

that is, the content of A with the class[19] of worlds where A does not hold. The intuitive point of this connection - essentially that proposed by Popper [32] and exactly that adopted by Carnap [31] - is brought out by inserting these auxiliary definitional stages:

set-up a refutes $\Delta =_{Df} \Delta$ does not hold in a;
$c(\Delta) =_{Df} \{a: a \text{ refutes } \Delta\}$,

i.e. the logical content of Δ is given by the situations which refute Δ or which Δ excludes. Incidentally the definition has been widened, by use of metavariable Δ, to take account of the content of all formulae including ill-formed formulae. The definition of refutation leads at once to such classical results as that if A entails B and a refutes B then a refutes A. As usual we say that A has no logical content iff $c(A) = \Lambda$, i.e. iff no world rules it out, and otherwise that A has some logical content; and that A has total logical content if $c(A) = V$, i.e. the class of all worlds (in the canonical model). Then, of course, an assertion has no content if no world refutes it, and total content if every world refutes it. Thus ill-formed formulae have no logical content. Since the class of worlds which refute A & B includes the class which refute A, $c(A) \subseteq c(A \,\&\, B)$. It is this result in particular, as Popper noticed, which warrants regarding c as a content notion: for there is a good sense in which A & B generally says more than A. But if A demonstrably entails B then B does not add anything to A, i.e. $c(A \,\&\, B) \subseteq c(A)$. Indeed the fact that $A \rightarrow B$ is provable iff $c(A \,\&\, B) = c(A)$ - a principle commonly adopted, e.g. by Halldén, to define entailment - provides yet a further warrant for regarding c as the logical content notion.

Moreover several desirable principles follow, in particular:-

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[19] Though the familiar class terminology has been adopted to make comparisons easy, a treatment of content as a property of statements would be more apposite. In fact everything done is compatible with such a treatment, which can be simply obtained by reconstruing $\{H: A \text{ is not in } H\}$ as $\lambda H(A \text{ is not in } H)$ where λ provides property abstraction, or as $\theta\{H: A \text{ is not in } H\}$ where θ is a suitable 1-1 function.

The exclusion account of content given is by no means the only notion of content that has figured in philosophical theories. Another important notion is that of signification: s(A) is defined as the class of assertions entailed by A. Semantically,

$$s(A) = \{C: c(C) \subseteq c(A)\}$$

Since

$$c(A) = \cup\{c(C): c(C) \subseteq c(A)\},$$

it is evident that these explications are closely related attempts to capture the same determinable: content. My feeling is that the more syntactically oriented signification notion is the less satisfactory attempt.

Every wff has some content: thus every tautology has some content.

No wff has total content; so no contradiction has total content.

If A and B are disjoint wff, then they have distinct (non-inclusive) contents.

In particular, then, any two tautologies with distinct variables have distinct contents, and similarly distinct contradictions.

By contrast, the same definition of logical content based on a strict implicational relation leads to such counter-intuitive results such as that some assertions, namely necessarily true ones, have no content, whereas others, the negations of necessary assertions, have total content (see, e.g., Carnap [31]). Thus, strict implication, and likewise its metalinguistic formulations, such as L-implication, far from capturing a natural and inevitable account of logical content and necessary truth, embodies positivistic views as to the nature of necessary truth. This view of necessary truths as without content can also be explained as following from the view that they can always be suppressed. For using Halldén's principle, an assertion which does not add anything to any assertion either has no content or its content is included in that of every assertion. But some assertions are quite disjoint in meaning from others. Therefore necessary truths, like ill-formed formulae, have no logical content. Conversely, of course, the view that necessary truths have no content has been used to prop up the claim that they can be suppressed.

From a communicational viewpoint the strict account is ridiculous. A person transmitting necessary truths over some channel, e.g. through logic textbooks, is not sending no information and the less the higher the ratio of theorems; nor is the receiver getting no information. Likewise it is more than merely "strange" that a self-contradictory assertion - one which no "ideal" receiver would accept - is regarded as carrying with it the most inclusive information. Despite the Carnap-Bar-Hillel strict theory of information, contradictions are commonly not so vastly informative.

Inclusion of meaning - in the sense of content - provides an account of meaning connexion which answers Bennett's demand ([47], p. 214) that where there is an entailment there is a meaning connexion but that for some B there is no meaning connexion between A & ~A and B. Indeed these desirable principles follow from the account of inclusion of meaning given:

No wff is part of the meaning of every wff; in particular no tautology is part of the meaning of every wff.

No wff includes in its meaning every proposition; in particular no contradiction includes in its meaning every proposition.

For sentential wff A and B, B is included in the meaning of A only if B shares a sentential letter with A.

Where propositional identity is defined as coinclusion of logical content, i.e. as identity of logical content - a not implausible, but still less than adequate, proposal - it follows further that tautologies are propositionally distinct from other tautologies when they contain distinct propositional letters. Similarly for contradictions. But using similar definitions in terms of strict implication one would obtain the disastrous result that there is just one necessary proposition, which is included in the meaning of every proposition, and just one contradiction, which includes in its meaning every proposition.

In communication it is important to say not only what information a message or experiment has supplied but also how much. Hence in addition to an explication of content, or information, an explication of amount of information is sought.

The theory of semantic information is that part of the full theory of information that is concerned with the information and amount of information carried by an assertion, not that concerned with the information a sender of a message intended to convey by transmitting the message nor with the information a receiver actually obtained from the message - these issues are said to belong to pragmatics. The main parameters of the full theory of communication are nicely exhibited in Lasswell's slogan: who sends what in which channel to whom with what effect. The semantic theory is concerned only with what and what amount of information.

A major defect of the standard theory of semantic information, based on the work of Carnap and Bar-Hillel, is that under all the explications of information considered

> the amount of information carried by the sentence '17 x 19 = 323' is zero and ... the amount of information of 'The three medians of the sides of a plane triangle intersect in one point', relative to some set of sentences serving as a complete set of axioms for Euclidean geometry, is likewise zero ([33], p. 223).

Carnap and Bar-Hillel attempt to minimize[20] this problem by introduction of an "ideal receiver":

> The semantic information carried by a sentence with respect to a certain class of sentences may well be regarded as the 'ideal' pragmatic information which the sentence would carry for an 'ideal' receiver whose only empirical knowledge is formulated in exactly this class of sentences. By an 'ideal' receiver we understand, for the purposes of this illustration, a receiver with a perfect memory who 'knows' all of logic and mathematics, and together with any class of empirical sentences, all of their logical consequences.

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[20] An even shabbier ploy has been invoked recently by Hintikka who requires, in order to save his logic of knowledge, 'epistemically perfect worlds' 'inhabited solely by deductively ommiscient beings', i.e. beings who know all the strict consequences of what they know, and also that they know that every other being is deductively ommiscient.

The theory of semantic information would be vastly improved by a diminution in the role of "ideal receivers"; for no human or animal receiver can in any way approximate to an ideal receiver.

As with the theory of logical content, so with the theories of semantic information measure; the theories can be substantially improved and major anomalies removed simply by setting the theories on a more adequate base, by replacing the underlying classical basis consisting of state descriptions or possible worlds by a new semantical base which includes further classically-neglected worlds, notably inconsistent and radically-incomplete worlds. Such a new base ultralogic provides. We have already seen the dramatic, and beneficial, effect of the change of basis in the case of explications of content. Let us consider now a similar revamping of the Carnap-Bar-Hillel proposed quantitative explications of semantic information. These revampings also foreshadow moves to come: for practically the whole of Carnap's semantical work, including the theory of logical probability and its ramifications, can be similarly refounded, on ultralogical foundations.

Carnap and Bar-Hillel offer two explications of amount of information, both of them important. Let us examine, in detail, an ultralogical resetting of the first explication, that of content measure.

In order to set out this account and to pave the way for ultramodal probability theory, the theory of semantic measures, on deductive situations, has first to be sketched. Previously semantical measure theories have all been based essentially on the theory of state descriptions or possible worlds. Thus all the measures and relations introduced have been modal, in that strict or provable equivalents are intersubstitutable everywhere for one another. This is already a mistake: a genuinely propositional measure should only allow generally the intersubstitutivity of propositional identicals. Many other deficiencies in the standard approaches, leading to philosophical puzzles, result from the use of possible worlds. However the usual theory can be generalized, and can be based on improved semantical accounts of propositional or content identity. Whatever the correct semantical theory of propositional identity is - and it is certainly not the modal theory or the purely sentential theory - propositional measure theory can be based on it. It has been argued elsewhere (especially in [6]) that one correct account of propositional identity is given, at the first degree (i.e. where no nesting of entailments or identities occur), by the theory of deductive situations, that propositions are given by logical content, or, what comes to the same, by ranges, and that truth functional assertions A and B are propositionally identical iff they hold in the same deductive situations. (When higher-degree expressions are introduced, a more sophisticated account is needed; see again [6]. But all the measure theory that follows will be confined to the first degree.)

Propositional measure theory simply extends the measure theory of Carnap [38]. In other words, the main definitions used are the same as in the case of measures based on model sets or state descriptions. Because however the semantical basis is different one gets different and more satisfactory results - more general in application, and less paradoxical.

Consider, as has become customary, the finite case, where all connectives are truth functional and quantified wff are expanded truth-functionally. The method in the infinite case, obtained in Carnap's way by taking limits, goes over largely intact. The finite case is typically obtained by supposing that there are k individual constants and m predicates, so that there are finitely many elementary assertions, e.g. k X m if all the predicates are one-place, as is often assumed, to avoid problems of dependence that the modal treatment runs into, but which the ultramodal treatment avoids. At any rate it is supposed in the finite case that there just n initial assertions or wff, for some n. These generate 4^n situations $a_1, \ldots, a_{4^n} = a_m$. Where $p_1, \ldots, p_n$ represent the n wff, the 4^n situations may be listed by constructing a holding (or truth-table type) assignment for p_1, $\sim p_1$, p_2, $\sim p_2$, $\ldots$, p_n, $\sim p_n$. For example, where n=2, we set out the holding assignment (which treats p_i and $\sim p_i$ as independent variables), writing 1 where p_i holds and 0 where it does not;

p_1	$\sim p_1$	p_2	$\sim p_2$	Corresponding situations, in terms of what holds in them
1	1	1	1	p_1, $\sim p_1$, p_2, $\sim p_2$
1	1	1	0	p_1, $\sim p_1$, p_2
1	1	0	1	p_1, $\sim p_1$, $\sim p_2$
1	1	0	0	.
1	0	1	1	.
1	0	1	0	.
1	0	0	1	
1	0	0	0	
0	1	1	1	
0	1	1	0	
0	1	0	1	
0	1	0	0	.
0	0	1	0	.
0	0	0	1	.
0	0	0	0	Λ

Where n=1 there are 4 situations:

a_1	p_1, $\sim p_1$
a_2	p_1
a_3	$\sim p_1$
a_4	Λ, i.e. neither p nor $\sim p$ holds in a_4.

Next measures are assigned to situations. The question arises: why start with measures on situations: why not simply begin with measures assigned to propositions and work back to measures on situations? Jeffrey [37] shows that this procedure would be less general. One cannot work back uniquely from measures for propositions to measures for situations, so one would have to assign measures to situations as well!

A propositional measure function m simply assigns to each situation a in class of situations K an (extended) real number m(a). Function m is usually constrained by further conditions, e.g. in probability and information theory it is typically required that:

a. $m(a) \geqslant 0$, for each $a \in K$, and

b. $\sum_{a \in K} m(a) = 1$.

Such a measure function is called a normal (regular in Carnapian probability theory) m-function, because the measure is normalised by the requirements. To require, however, as Carnap's work suggests, that the measure is zero at most on worlds which are not possible ones is a deficiency: one wants to be able to restrict assessments to natural situations for example.

Measures for propositions are defined in terms of measures of the situations in which they hold (or in which they fail to hold). Since the proposition that A is given by the class of situations where A holds such a connexion is to be expected: for then

$$\begin{aligned} m(A) = m'(\S A) &= m'\,\Theta\{a : I(A, a) = 1\} \\ &= f\,\{m(a) : I(A, a) = 1\}\ , \end{aligned}$$

assuming that the situations count just because of their measures. (The matter is in general not quite so simple as this because the measure may depend on other situational measures as well, e.g. probability weighted measures for desirability measures.)

Two connected issues which arise are these: What function of the range of A is m(A)?, and how much variation in the function can be taken up in the latitude allowed in assigning measures to situations? Carnap argues, in the case of probability measures, that the measure of A is the sum of the m-values of situations in the range of A; i.e. he argues ([38], p.279) for the condition:

c. $m(A) = \sum_{a \in \{c : I(A, c) = 1\}} m(a)$,

This assignment has been taken over and defended by later writers (e.g. Jeffrey [37]).[21] Call such an assessment rule the normal rule, and call normal measures those where the normal rule applies to normal m- functions. The ultralogical theory of normal measures will be elaborated and compared with Carnap's modal theory when we come to probability logic (in the next section).

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[21] The rule in fact follows upon assumption of certain conditions of adequacy, as Kemeny shows in his generalisation of Carnap's theory: see [40]. It is not at present clear whether or not this procedure can be ultramodally extended, since the argument given makes heavy use of the modal fact that m(C) = 1 for every tautology C.

Normal measures do not suffice for all the many purposes[22] for which semantical measure theory is wanted. For example, for semantical preference and decision theory a more sophisticated measure seems to be needed. But for semantic information theory normal measures appear to suffice, though the scale, fixed at the bottom at states of no information by zero, has an arbitrarily chosen upper bound.

Given a logical measure m on deductive situations, the first explication of amount of information, that of content measure, is as follows:-

$$\mathrm{cont}(A) = \sum_{a \in \{c : I(A,\, c) \neq 1\}} m(a)\ ,$$

$$\text{i.e.} \quad \sum_{a \in c(A)} m(a)\ ,$$

i.e. the content measure of A is the sum of the measures on the content of A. Given modal measures, i.e. that all logical situations are possible worlds or determined by state descriptions, the Carnap-Bar-Hillel definition

$$\mathrm{cont}(A) = m(\sim A)$$

follows. For

$$\begin{aligned} m(\sim A) &= \sum_{a \in \{c : I(\sim A,\, c) = 1\}} m(a) \\ &= \sum_{a \in \{c : I(A,\, c) \neq 1\}} m(a) \\ &= \mathrm{cont}(A)\ . \end{aligned}$$

But with the full range of logical situations admitted, this undesirable reduction does not ensue. To show the merit of the ultramodal theory, it is now compared with the Carnap-Bar-Hillel theory. Theses of the latter modal theory are listed and their status as ultralogical semantical theses (shown by $\models$) or rejections ($=\!\!|$) indicated.

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[22] Modal measures from the three following groups have been studied, more or less extensively:

(1) Probability, (credibility), confirmation, confidence.
(2) Utility, preferability, desirability, and other valuation and choice measures (e.g. goodness).
(3) Content, informativeness.

Clearly the list could be extended. Thus Rescher has added:

(4) Cost, feasibility.

He introduces C(p), the cost of bringing it about (assuring) that p, i.e. the price that must be paid to guarantee the truth of p. According to Rescher the logic of cost is isomorphic with the (modal) logic of information.

Ultralogical accounts of many of these notions (ultramodal preference theory, decision theory, measure theory, confirmation theory, etc.) are attempted in [29].

$\models 1 \geqslant \mathrm{cont}(A) \geqslant 0$; $\Dashv \mathrm{cont}(A) = 1 - m(A)$; $\Dashv \mathrm{cont}({\sim}A) = m(A)$.

$\Dashv \mathrm{cont}(A) = 0$ iff A is necessary (L-true); $\Dashv \mathrm{cont}(A) = 1$ iff A is impossible (L-false).

Thus necessary propositions do not carry no measure of information, and impossible propositions do not convey total information.

$\models$ if $A \Rightarrow B$ then $\mathrm{cont}(A) \geqslant \mathrm{cont}(B)$; $\Dashv$ if $A \mathrel{⥽} B$ then $\mathrm{cont}(A) \geqslant \mathrm{cont}(B)$.

$\models$ if $A \Leftrightarrow B$ then $\mathrm{cont}(A) = \mathrm{cont}(B)$; $\Dashv$ if $A \mathrel{⥼⥽} B$ then $\mathrm{cont}(A) = \mathrm{cont}(B)$.

$\models \mathrm{cont}(A \,\&\, B) \geqslant \mathrm{cont}(A) \geqslant \mathrm{cont}(A \vee B)$.

$\models \mathrm{cont}(A \vee B) = \mathrm{cont}(A) + \mathrm{cont}(B) - \mathrm{cont}(A \,\&\, B)$.

$\models \mathrm{cont}(A \vee B) = \mathrm{cont}(A) + \mathrm{cont}(B) - 1$, iff A excludes B, where A *excludes* B iff $c(A) \cup c(B) = V$, i.e. $r(A) \cap r(B) = \Lambda$, i.e. the ranges of A and B are disjoint. The last result follows because

$$
\begin{aligned}
\mathrm{cont}(A \,\&\, B) = 1 \quad & \text{iff} \quad 1 = \sum_{a \in \{c : I(A,\, c) \neq 1 \,\vee\, I(B,\, c) \neq 1\}} m(a) \\
& \text{iff} \quad 1 = \sum_{a \in c(A) \cup c(B)} m(a) \\
& \text{iff} \quad A \text{ excludes } B.
\end{aligned}
$$

$\models \mathrm{cont}(A \,\&\, B) = \mathrm{cont}(A) + \mathrm{cont}(B) - \mathrm{cont}(A \vee B)$; $\models \mathrm{cont}(A \,\&\, B) = \mathrm{cont}(A) + \mathrm{cont}(B)$ iff A disjoins B,

where A *disjoins* B iff $c(A) \cap c(B) = \Lambda$. (It is here assumed that $\sum_{\Lambda} m(a) = 0$.)

$\Dashv \mathrm{cont}({\sim}A) = 1 - \mathrm{cont}(A)$; this rejection is central to the ultramodal theory; In contrast, where m is a modal measure, $\models \mathrm{cont}({\sim}A) + \mathrm{cont}(A) = 1$, and conversely. For, for arbitrary A, $\mathrm{cont}({\sim}A) + \mathrm{cont}(A) = 1$

iff $c(A) \cup c({\sim}A) = V$ (i.e. the class K of all situations)
iff $\{a : I(A,\, a) \neq 1\} \cup \{a : I({\sim}A,\, a) \neq 1\} = K$
iff $\{a : I(A,\, a) \neq 1 \vee I({\sim}A,\, a) \neq 1\} = K$
iff $\{a : I(A \,\&\, {\sim}A,\, a) \neq 1\} = K$
iff for every a, $I(A \,\&\, {\sim}A,\, a) \neq 1$, i.e. just the modal requirement.

The relative amount of information of B with respect to A, $\mathrm{cont}(B/A)$, is defined, in terms of the absolute amount, in the following way by Carnap and Bar-Hillel:

$$\mathrm{cont}(B/A) = \mathrm{cont}(A \,\&\, B) - \mathrm{cont}(A).$$

$\models$ $\mathrm{cont}(B/A) = \mathrm{cont}(B) - \mathrm{cont}(A \vee B)$; for $\mathrm{cont}(A \,\&\, B) - \mathrm{cont}(A) = \mathrm{cont}(A) + \mathrm{cont}(B) - \mathrm{cont}(A \vee B) - \mathrm{cont}(A)$.

$\models$ $\mathrm{cont}(B/A) = \mathrm{cont}(B)$ iff A disjoins B.

$\models$ $\mathrm{cont}(B/A) = \mathrm{cont}(A \supset B)$, provided m is a modal measure.

$\Dashv$ $\mathrm{cont}(B/A) = \mathrm{cont}(A \supset B)$, i.e. the relative content-measure of B given A is not the same as the absolute content-measure of the material implication $A \supset B$. In defence of this principle - for modal measures - Carnap and Bar-Hillel try to make out that

> If an 'ideal' receiver possesses the knowledge i and then acquires the knowledge j, his possession of information is only increased in the same amount as if $i \supset j$ were added instead of j. This is, indeed, highly plausible since j is a logical consequence of the sentences i and $i \supset j$, and an 'ideal' receiver, by definition, is able to draw such consequences instantaneously.

This is patent sophistry. Though $\models \mathrm{cont}(A \supset B) = \mathrm{cont}({\sim}A \vee B)$, Carnap and Bar-Hillel have to rely on the paradoxical proposition that $\mathrm{cont}(B) = \mathrm{cont}(A \vee B) + \mathrm{cont}({\sim}A \vee B)$ and on the modal thesis that if $A ⥽ B$ then $\mathrm{cont}(B/A) = 0$ - both rejected on ultramodal assumptions. All that is true is:

$\models$ if $A \Rightarrow B$, $\mathrm{cont}(B/A) = 0$. For if $A \Rightarrow B$ is a thesis, then so is $A \,\&\, B \Leftrightarrow A$; so $\mathrm{cont}(A \,\&\, B) = \mathrm{cont}(A)$, whence $\mathrm{cont}(B/A) = 0$.

It is worth observing that corresponding transmission principles for epistemic functors such as knowledge - as distinct from logical notions like information - fail. Finally, $\models \mathrm{cont}(B/A) \leqslant \mathrm{cont}(B)$.

The specific results adduced by Carnap and Bar-Hillel which depend on defining content in terms of a proper measure function fail because they depend essentially on the mistaken principle that tautologies have no content. Analogues of their results could, however, be derived using $\mathrm{cont}(A/t)$, with t the sentential constant previously introduced, under the (false) hypothesis that $\mathrm{cont}(t) = 0$.

Other major theses of the Carnap-Bar-Hillel theory also require special assumptions. The following interesting result fails where m is not a proper measure or not a modal measure:

$\models$ where m is a proper modal measure, and B_i and B_j are basic sentences with different primitive predicates,

$\mathrm{cont}(B_j/B_i) = 1/4 = 1/2\ \mathrm{cont}(B_i)$.

The background assumptions required for this significant proposition are worth elaborating. The result depends firstly on the following conditions on proper measures:

d. If B_j is formed from B_i by replacing any of the primitive predicates of B_i by their negations (omitting double negation signs), then $m(B_j) = m(B_i)$ (i.e. each primitive property is treated on a par with its complement).

e. If A and B have no primitive predicates in common, then $m(A \& B) = m(A) \times m(B)$.

Then $\models$ for any B, $m_{pm}(B) = 1/2$, where m_{pm} is a proper modal measure. For since

$$\begin{aligned} \vdash B \vee {\sim}B,\ 1 = m_{pm}(B \vee {\sim}B) &= m_{pm}(B) + m_{pm}({\sim}B) \\ &= 2m_{pm}(B) \quad \text{by d.} \end{aligned}$$

There are three further preliminary results:-

$\models$ for any conjunction C_n of n basic sentences with n distinct predicates, $m_{pm}(C_n) = (1/2)^n$, by applying e.

$\models$ for any basic sentence B, $\mathrm{cont}_{pm}(B) = 1/2$.

$\models$ for any conjunction C_n of n basic sentences with n distinct primitive predicates, $\mathrm{cont}_{pm}(C_n) = 1 - (1/2)^n$.

Assembling these preliminaries it follows:

$$\begin{aligned} \models \mathrm{cont}(B_j/B_i) &= \mathrm{cont}(B_j \& B_i) - \mathrm{cont}(B_i) \\ &= (1 - 1/4) - 1/2 = 1/4 \\ &= 1/2\ \mathrm{cont}_{pm}(B_i). \end{aligned}$$

Carnap and Bar-Hillel comment:

> According to this theorem, if an 'ideal' receiver with no previous knowledge receives a sequence of n basic sentences with n different primitive predicates, the amount of information he gets from the first sentence is 1/2, from the second only 1/4, from the third 1/8, from each only half as much as from the preceding one. And this will be the case despite the fact that these basic sentences are independent from each other not only deductively but also inductively. One has the feeling that under such conditions the amount of information carried by each sentence should not depend upon its being preceded by another of its kind.

Call this the CBH paradox; for it is paradoxical that the amount of information of independent sentences should diminish in this way. The paradox appears to destroy the Carnap and Bar-Hillel theory. The paradox arises from a conflict between requirements on modal measures on the one hand and on proper measures on the other; for the first requirements make the measure of ~fa dependent on the measure of fa (as 1 - measure of fa) whereas the second requirements, because of d and e, treat negated basic sentences as virtually independent.

Carnap and Bar-Hillel propose to "resolve" the conflict of intuitions engendered by the paradox - which they surprisingly try to ascribe to a conflict as to which condition to impose on the additivity requirement $\mathrm{cont}(A \& B) = \mathrm{cont}(A) + \mathrm{cont}(B)$ - by supposing that there is not one explication of "amount of semantic information" but at least two.[23] This is however but a transparent pretext for introducing a measure resembling the Shannon-Wiener measure of statistical information theory.

The new proposal is as follows:

$$\inf(A) = \text{Log}\,\frac{1}{1 - \text{cont}(A)}\ ,$$

where 'Log' is short for 'logarithm to the base 2'. This is equivalent for modal measures to:

$$\models \inf(A) = \text{Log}\,\frac{1}{m(A)} = -\text{Log}\ m(A)\ ,$$

and is analogous to the customary definition of amount of information in communication theory, except that, in place of the (probability) measure m, statistical probability is used in the communication theory definition. A second explication of amount of information by a semantical measure then simply takes over this connexion to define:

$\inf(A) = -\text{Log}\ m(A)$. So $\models m(A) = 2 - \inf(A)$.

Then a modified version of the Carnap-Bar-Hillel theory results with differences appearing in the same set of places as before: e.g.

$\models 0 \leqslant \inf(A) \leqslant \infty$; $\Dashv \inf(A) = 0$ iff A is necessary; $\Dashv \inf(A) = \infty$ iff A is impossible.

$\models$ if $A \rightarrow B$ then $\inf(A) \geqslant \inf(B)$; $\Dashv$ if A ⥽ B then $\inf(A) \geqslant \inf(B)$.

Additivity holds in the Carnap-Bar-Hillel form:

$\models \inf(A \,\&\, B) = \inf(A) + \inf(B)$ iff A and B are inductively independent, i.e. $m(A \,\&\, B) = m(A) \times m(B)$.

Proof:

$$\begin{aligned} \inf(A) + \inf(B) &= -\text{Log}\ m(A) + -\text{Log}\ m(B) \\ &= \text{Log}\ 2^{\inf(A)} + \text{Log}\ 2^{\inf(B)} \\ &= -\text{Log}\ (2^{-\inf(A)} \times 2^{-\inf(B)}) \\ &= -\text{Log}\ (m(A) \times m(B)) \\ &= -\text{Log}\ m(A \,\&\, B)\ . \end{aligned}$$

More generally, results independent of negation and paradoxes hold in the classical form.

§12. *Ultramodal probability logic.* If semantical information theory can be more satisfactorily reworked ultramodally, should not the same apply to logical probability theory, especially as probabilification is a sort of information-conveying relation? The answer is, of course, yes, and that, once again, several anomalies can be removed from classical probability theory - which is thoroughly modal - by ultramodal remodelling. But the case for the remodelling is different, and really needs to be developed afresh.

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[23] The method of finding ambiguity in the explicandum or in ordinary notions is a favourite formalist dodge in the face of paradox. Mostly, however the paradoxes generated are engendered by the inadequacy of the underlying formalism to the explication required - inadequacy commonly attributable to conformity to extensional or modal constraints.

There are two familiar theses, both I believe correct, from which a new beginning can be made, namely

(I) There is a logical relation between premiss and conclusion of an argument, or antecedent and consequent of an implication, of extent of conclusiveness, or, as I shall say, following more recent literature, a relation of partial entailment. If there is such a relation it can of course be extended, quantified and metrised.

(II) Just such a logical relation provides a (sometimes, it is claimed, the) major explication of the relation of logical probability and also (in one sense again) of confirmation.

These theses have been extensively argued for in the literature, notably by Keynes [39] and Johnson [41]; the theses remain very much live issues and they have been defended recently, e.g. by Stove [43].

Given these theses the next question is as to the logical properties of the relation, which can be represented in a standard metrical way as $P(h, e) = r$, i.e. e entails h to degree r; that is to say, given the theses, the logical probability of h on or given e is r, where r is some real number, conventionally restricted to the closed interval $[0,1]$. Now degree of conclusiveness of an argument coincides, in the maximal case, i.e. where $P(h, e) = 1$, with the relation of valid argument, that is, on both classical and relevant grounds, it coincides with e's entailing h. That is, maximal conclusiveness of antecedent of an implication for consequence just is entailment. But entailment should be explicated, as before, ultramodally, not as a strict implication relation as the classical theory of probability would have. In short, logical probability, explicated in terms of degrees of entailment, properly requires an ultramodal analysis. Fortunately a semantics for such a theory is virtually at hand; at least for first degree wff, Carnap's modal semantics for logical probability straightforwardly generalises to an ultramodal semantics based on deductive situations.

The argument for a new and different probability logic does not rest merely on the fact that in a limiting case maximal partial entailment, which just is entailment, should be a good entailment, a proper sufficiency relation. Rather similar points apply in the case of less than maximal partial entailment as apply for entailment itself. Where A partially entails B what should be captured is whether A on its own partially ensures B, not whether A together with all logical truths or necessary propositions partially guarantees either B or some logical falsehood - which is what the modal analysis conflates with partial entailment. For a satisfactory account all these non-contingent propositions which the modal account suppresses should be discarded. And this can be done semantically exactly as in the analysis of full entailment, by considering situations where necessary propositions fail and also situations where logical falsehoods hold. Thus the measure in terms of which degrees of partial entailment are defined should extend out over incomplete and inconsistent deductive situations.

Accordingly for a metrical analysis of partial entailment, just as for semantic information, measures are taken over all deductive situations. As there too, it can safely be assumed that measures are normal. For probability logic some of the theory of normal measures is needed. At the same time as setting out valid and invalid assertions on the ultramodal theory, it is worth comparing the theory with Carnap's modal account from which it derives. Recall, to begin, the conditions on normality, especially

c. $m(A) = \sum_{a \in r(A)} m(a)$,

where the range of A, r(A), is the class of deductive situations where A holds, i.e. $\{c \in K : I(A, c) = 1\}$.

$\models$ if A entails B then $m(A) \leq m(B)$; $\Dashv$ if A strictly implies B, then $m(A) \leq m(B)$.

$\models$ if $A \leftrightarrow B$ (A coentails B) then $m(A) = m(B)$; $\Dashv$ if A is strictly equivalent to B, then $m(A) = m(B)$.

$\models m(A \,\&\, B) \leq m(A) \leq m(A \vee B)$.

Proof: From the entailment result above. Alternatively, $m(A \,\&\, B)$

$$= \sum_{a \in \{c:I(A \,\&\, B,\, c) = 1\}} m(a) = \sum_{\{a:I(A,\, a) = 1\} \cap \{a:I(B,\, a) = 1\}} m(a) \leq \sum_{\{a:I(A,\, a) = 1\}} m(a) .$$

$\models m(A \vee B) = m(A) + m(B) - m(A \,\&\, B)$.

Proof: $m(A \vee B) + m(A \,\&\, B) = \sum_{r(A) \cup r(B)} m(a) + \sum_{r(A) \cap r(B)} m(a) =$

$$\sum_{r(A)} m(a) + \sum_{r(B)} m(a) - \sum_{r(A) \cap r(B)} m(a) + \sum_{r(A) \cap r(B)} m(a) = \sum_{r(A)} m(a) + \sum_{r(B)} m(a) = m(A) + m(B).$$

$\models m(A \,\&\, B) = m(A) + m(B) - m(A \vee B)$; $\models m(A \vee B) = m(A) + m(B)$ iff $m(A \,\&\, B) = 0$; $\models m(A \,\&\, B) = m(A) + m(B) - 1$ iff $m(A \vee B) = 1$; $\models m(A \,\&\, B) \leq m(A) + m(B)$.

$\models$ if $m(A \,\&\, B) = 1$, then $m(A) = 1 = m(B)$; for $1 \geq m(A) \geq m(A \,\&\, B)$.

$\models$ if $m(A) = 0$, then $m(A \,\&\, B) = 0$; and $\models$ if $m(A) = 0 = m(B)$ then $m(A \vee B) = 0$.

Proof: if $m(A) = 0$ then $m(A \,\&\, B) = 0$, so $m(A \vee B) = m(A) + m(B)$.

$\models$ if $m(A) = 1 = m(B)$ then $m(A \,\&\, B) = 1$.

$\models m(A_1 \vee \ldots \vee A_n) = \sum_{i=1}^{n} m(A_i)$, where $m(A_\alpha \,\&\, A_\beta) = 0$ for every α, β in (1, n).

But there is no need to go about proving very many of these results directly. For every modal result which avoids use of the negation rule carries over intact to the ultramodal theory, since all positive requirements, those for conjunction, disjunction and the quantifiers, coincide. (Thus too ultramodal probability theory represents a less drastic departure from the classical theory than the orthological probability logic exponents of orthological quantum logic are strictly committed to, since this theory must diverge also on disjunction and particularity.) A (normal) *modal* measure is a normal measure m such that $m(a) = 0$ iff a is not a consistent and complete world, i.e. $m(a) > 0$ iff a is a (complete) possible world.

The theorems on modal measures are exactly those established by Carnap [38] for his measures. Any *positive* theorem on modal measures - more generally of modal probability theory - is a theorem on ultramodal measures - more generally of ultramodal probability theory. Algebraically this comes out very clearly: while classical probability theory amounts to a measure theory on Boolean algebras, ultramodal probability theory amounts to such a measure theory on De Morgan lattices.

The fundamental difference between ultramodal measures and classical ones shows up with negation. Though $\models m(A) + m({\sim}A) \leqslant 1$, $\Dashv m({\sim}A) = 1 - m(A)$. $m({\sim}A)$ and $m(A)$ may behave much more independently, a most important feature when it comes to applications. Likewise classical expansions, analogous to implication paradoxes, are rejected: $\Dashv m(A) = m(A \mathbin{\&} {\sim}B) + m(A \mathbin{\&} B)$. The difference over negation spills over into differences as to non-contingent assertions. Though $\models 0 \leqslant m(A) \leqslant 1$ of course, $\Dashv 0 < m(A) < 1$ iff A is contingent; $\Dashv m(A) = 1$ where A is valid (more sweepingly, iff A is logically necessary); and $\Dashv m(A) = 0$ where A is logically false. By making use of the constant t introduced earlier the classical theory can be represented ultramodally: the assumption is always: $m(t) = 1 \mathbin{\&} m(f) = 0$, where $f =_{Df} {\sim}t$. Then as $t \rightarrow A$ where A is a theorem, if $m(t) = 1$, $m(A) = 1$; so $m(A) = 1$ given $m(t) = 1$. Similarly as ${\sim}A \rightarrow {\sim}t$ when A is a theorem, $m({\sim}A) \leqslant m({\sim}t) = 0$; so $m({\sim}A) = 0$ given $m({\sim}t) = 0$. Hence, under the assumption, $m(A \mathbin{\&} {\sim}A) = 0$, so too $m(A) + m({\sim}A) = 1$, i.e. $m({\sim}A) = 1 - m(A)$.

A partial entailment ratio is now defined in terms of semantical measures as follows: c(A, B) is defined as the sum of the measures of B-situations where A holds divided by the sum of measures of B-situations. But the measures of B-situations, i.e. situations where B holds, where A also holds, just are the measures of (A & B)-situations. Thus

$$c(A, B) =_{Df} m(A \mathbin{\&} B)/m(B).$$

To complete the definition the case where $m(B) = 0$ has to be dealt with. It should be noted that this case will not arise unless extra conditions, such as the assumption $m(B) = 0$, are imposed on the modelling. Let us stipulate that where $m(B) = 0$, $c(A, B) = 1$, though this raises, as Carnap points out ([38], p. 296) difficulties in the infinite case on the limit approach. (If we had chosen a more suitable range for values of the measure function, e.g. the interval $[0, +\infty]$ instead of the interval $[0, 1]$, dictated by the frequency theory of probability, further stipulation would have been unnecessary.)

Where m is a normal measure, the corresponding confirmation function c is called, following Carnap, a regular confirmation function, and if m is modal, c is also modal. All the results which follow in the sketch of ultramodal probability theory, and comparison with Carnap's theory, are established for regular functions in the finite case. To facilitate the comparison with Carnap, his notation is adopted, 'h' for hypothesis statement, 'e' for evidence, etc.

$\models 0 \leqslant c(h, e) \leqslant 1$; $\Dashv$ if $\vdash e \supset h$ then $c(h, e) = 1$; $\Dashv$ if $e ⥽ h$ then $c(h, e) = 1$.

$\models$ If $e \rightarrow h$, then $c(h, e) = 1$.

Proof: If $e \rightarrow h$ then $e \,\&\, h \leftrightarrow e$, so $m(e) = m(e \,\&\, h)$.

$\Dashv$ If h is L-true (necessary), $c(h, e) = 1$; $\Dashv$ $c(t, e) = 1$; $\Dashv$ if $\vdash e \supset {\sim}h$, then $c(h, e) = 0$; $\Dashv$ if h is L-false (impossible), $c(h, e) = 0$; $\Dashv$ $c({\sim}t, e) = 0$.

$\Dashv$ If $\vdash e_1 \equiv e_2$ $(e_1 \mathrel{⥼\!⥽} e_2)$ then $c(h, e_1) = c(h, e_2)$; $\models$ if $e_1 \leftrightarrow e_2$ then $c(h, e_1) = c(h, e_2)$, identical evidence.

$\Dashv$ If $\vdash h_1 \equiv h_2$ $(h_1 \mathrel{⥼\!⥽} h_2)$ then $c(h_1, e) = c(h_2, e)$; $\models$ if $h_1 \leftrightarrow h_2$ then $c(h_1, e) = c(h_2, e)$, (propositionally) identical hypotheses.

In short, substitutivity conditions are of entailmental, not of modal, strength. This is what distinguishes the theory being developed as an ultramodal one. It should be evident that as partial entailment claims look out over all deductive situations, nothing short of entailmental coincidence is an adequate basis for intersubstitutivity: strict coimplication certainly should not be.

$\models c(h \vee i, e) = c(h, e) + c(i, e) - c(h \,\&\, i, e)$, general addition theorem.

Proof:

$$\begin{aligned} \underline{m((h \vee i) \,\&\, e)} &= \underline{m(h \,\&\, e \vee i \,\&\, e)} \\ &= \underline{m(h \,\&\, e)} + \underline{m(i \,\&\, e)} - m(\underline{h \,\&\, i \,\&\, e}), \end{aligned}$$

whence the result follows. The divisor is in each case m(e). A corollary is the special addition theorem:

$\models c(h \vee i, e) = c(h, e) + c(i, e)$, where $c(h \,\&\, i, e) = 0$.

$$\begin{aligned} \models c(h \,\&\, i, e) &= c(h, e) \times c(i, e \,\&\, h) \\ &= c(i, e) \times c(h, e \,\&\, i), \end{aligned}$$ general multiplication theorem.

Proof: $$\frac{m(h \,\&\, i \,\&\, e)}{m(e)} = \frac{m(h \,\&\, e)}{m(e)} \times \frac{m(i \,\&\, e \,\&\, h)}{m(e \,\&\, h}$$

$\models$ If $e \,\&\, h \rightarrow j$ then $c(h \,\&\, j, e) = c(h, e)$.

Proof: $e \,\&\, h \,\&\, j \leftrightarrow e \,\&\, h$, so $m(e \,\&\, h \,\&\, j) = m(e \,\&\, h)$, whence the result follows.

$\models c(h \,\&\, e, e) = c(h, e)$.

$\models c(h, e \,\&\, i) = \dfrac{c(h, e) \times c(i, e \,\&\, h)}{c(i, e)}$, general division theorem.

Proof: By the multiplication theorem:

$c(h, e) \times c(i, e \,\&\, h) = c(i, e) \times c(h, e \,\&\, i)$.

As expected then, positive theorems of classical probability theory emerge unscathed. The differences emerge with negation and negation-defined notions such as exclusion. The important difference, from the point of view of the classical axiomatisation of probability theory, can be located in the rejection: $=\!| \; c(\sim h, e) = 1 - c(h, e)$. And this has the important upshot ultramodally that both c(h, e) and c(~h, e) may have low probability values, and that both may have high values, as may happen in the case of so-called "inductive inconsistencies".

The essential result of this independence of values, of this new liberality, is a theory of vastly wider applicability than the modal theory. Just how will be no more than indicated here.

Firstly, there are a great many cases where, on given evidence, which may be slight or even zero, neither a hypothesis h nor its negation ~h has much, or even slight, probability. On the total evidence available to the ancient Sumerian neither the big bang hypothesis nor its negative had other than negligible probability.

Secondly, there are many cases where on the given evidence both a hypothesis and its negation have a high probability. Suppose the evidence e consists of the corpus of Newtonian physics together with successful empirical observation at a time shortly after the Michaelson-Morley experiment, and let the hypothesis h be that the light beams compared by the experiment take equal time for their respective journeys. Then c(h, e) is large because of the experimental result, and c(~h, e) is also large because of the predictions of an ether wind, and its effect on light beams,from the Newtonian corpus. It might be objected that the evidence e is physically inconsistent evidence. True, but nothing excludes such evidence. In fact, ultramodally the essential claim under discussion can be readily proved. Let $e = p \,\&\, \sim p$ and $h = p$. Then $c(h, e) = c(\sim h, e) = 1$.

Thirdly, then, the ultramodal theory can accommodate logically inconsistent evidence, which the classical theory has to rule out, on pain of inconsistency otherwise. Thus Carnap shows ([38], p. 341) that Jeffrey's axiom system, which fails to exclude self-contradictory evidence, is inconsistent in a damaging way.

The argument may be redrafted as follows:- Since $p \,\&\, \sim p \rightarrow p$ and $p \,\&\, \sim p \rightarrow \sim p$, $c(p, p \,\&\, \sim p) = 1 = c(\sim p, p \,\&\, \sim p) = 1 - c(p, p \,\&\, \sim p)$, by modal muddle. Thus $1 = c(p, p \,\&\, \sim p) = 0$, so $1 = 0$. But, contrary to what Carnap suggests, the restriction to non-self-contradictory evidence is a severe restriction on the scope of the modal theory. It rules out the dialectical application of the theory almost immediately (not that that would worry Carnap). Worse, it interferes seriously with the underlying idea of the probability relation as one of degree of conclusiveness of arguments; for of course arguments can have inconsistent premisses, and a general theory should allow for such premisses. We find a curious tension in Keynes on this point. Having contended that one must be prepared to consider probability relations between *any* pairs of sets of propositions, he has immediately to qualify his appealing thesis - on the grounds of *convenience*!

> Probability is concerned with *arguments*, that is to say, with the "bearing" of one set of propositions upon another set. If we are to deal formally with a generalised treatment of this subject, we must be prepared to consider relations of probability between *any* pair of sets of propositions, and not only between sets which are actually the subject of knowledge. But we soon find that some limitation must be put on the character of sets of propositions which we can consider as the hypothetical subject of an argument, namely, that they must be *possible* subjects of knowledge. We cannot, that is to say, conveniently apply our theorems to premisses which are self-contradictory and formally inconsistent with themselves.

But Keynes's generality argument ([39], p. 111) surely applies generally. It is not a matter of convenience but a limitation on classical and modal theories that they cannot be applied generally. The ultramodal theory removes that limitation.

There remain two further apparently substantial advantages of the ultramodal theory that I wish to advance with a little more caution, until the theory is more fully worked out. Firstly, the theory enables one to avoid standard objections to detachment in the case of statistical inference. Consider the case of statistical syllogisms, that is arguments of the form:

a is F:
The proportion of F's that are G is q.
Therefore, it is probable, to degree q, that a is G.

The standard objection to accepting any arguments of this form is clearly set out by Hempel ([43], p. 131) who contends that such

> syllogisms generate inductive inconsistencies in the following sense: For an argument with true premisses that has the form of a statistical syllogism, there exists, in general, a rival argument of the same form, again with true premisses, whose conclusion is logically incompatible with that of the first premiss.

But the conclusions of the rival arguments are not logically incompatible, and the idea that they are incompatible derives from the modal assumption that it cannot be the case that both p and ~p have a high probability. For the conclusions are of the form: $P_q\, G(a)$ and $P_q \sim G(a)$ and these are not incompatible without the mistaken consistency assumption $P_q \sim G(a) \rightarrow \sim P_q\, G(a)$, deriving from classical negation assumptions. It is tempting to toy with the idea that ultramodally detachment in the case of certain statistical inferences is in order, and that the crippling requirement of total evidence that the modal theory has to impose can be avoided. (This does not mean that that the total evidence requirement does not have an important place in decision theory.) Naturally the reinstatement of detachment from statistical syllogisms would give a considerable fillip to the business of accounting for and justifying inductive reasoning and procedures.

The second advantage of the ultramodal theory, that I tentatively advance for your consideration, would likewise provide a fillip to probability theory, since it would enable initial probabilities to be assigned to confirmation relations. The idea is, that the theory will allow for the adoption of a principle related to the principle of indifference of classical probability theory, a principle to the effect that where there is no evidence δ as to a hypothesis h or its negation ~h then $c(h, \delta) = c(\sim h, \delta) = 0$. The same should apply where the evidence is irrelevant; but a proper discussion of this leads away into the important question of relevance under the ultramodal theory. Rather than follow that line of development let us turn to the objection that though the ultramodal theory may, perhaps, have some advantages, it sacrifices central and crucial parts of the classical and modal theories which turn on negation features.

To simulate leading classical results, such as Bayes's theorem, which, as commonly formulated, make use of classical negation features, a beginning needs to be made on the ultramodal theory of conditions restricting situations. There are conditions imposed to limit the class of situations considered. There are two classes of conditions that are important for the philosophy of science envisaged ultramodally.

1. *Conformity* conditions. Thus, for example, a situation a conforms to a lawlike conditional if A then B if when $A \in a$ then $B \in a$. Physical laws or lawlike conditionals may be imposed in this way to provide a class of lawlike situations, for use, e.g., in the semantical assessment of counterfactual conditionals. On classical and modal accounts, however, conformity just collapses into the holding of a material conditional in a situation, thereby smudging a fundamental distinction.

2. *Exclusion* and *exhaustion* conditions. These take the following forms, for a given situation a: if $A \in a$ then $B \notin a$, if $A \notin a$ then $B \in a$, $A \in a$ iff $B \notin a$. Exclusion conditions are important in limiting the class of situations or cases to be considered in probability applications, as in Bayes's theorem. In this sort of case one statement is used to rule another out everywhere. Fortunately many of Carnap's definitions of L-concepts ([38], p. 83 ff.) are tailor-made for ultramodal purposes, among them that of L-exclusion, though they no longer always carry the intended modal interpretation, e.g. L-exclusion no longer serves as an explication of logical impossibility of joint truth. A *excludes* B iff $r(A) \cap r(B) = \Lambda$. Thence $\models$ A excludes B iff, for every a in K, if $I(A, a) = 1$ then $I(B, a) \neq 1$, i.e. canonically if $A \in a$ then $B \notin a$; but $\Dashv$ A excludes B iff $\vdash \sim(A \mathbin{\&} B)$. A class S of wff is *exclusive in pairs* if every wff of S excludes every other wff of S.

$\models m(A \vee B) = m(A) + m(B)$ where A excludes B.

$\models$ if A excludes B, $c(A \vee B, e) = c(A, e) + c(B, e)$, an alternative form of the special addition theorem. For if A excludes B,

$r(A \& B \& e) = \Lambda$; so $m(A \& B \& e) = \sum_{a \in r(A \& B \& e)} m(a) = \sum_{a \in \Lambda} m(a) = 0.$

Thus $c(A \& B, e) = 0$, and the result follows from the special addition theorem. This theorem also follows, in the same way, with the hypothesis that A excludes B with respect to e, i.e. A & e excludes B & e.

Special addition theorem for multiple disjunction. If $h_1, \ldots, h_n$ $(n \geqslant 2)$ are exclusive in pairs (with respect to e) then

$$c(h_1 \vee h_2 \vee \ldots \vee h_n, e) = \sum_{n=1}^{p} c(h_p, e).$$

Proof: From the preceding theorem by induction.

Preliminary theorem to Bayes's. Where $j = j_1 \vee \ldots \vee j_n$ (for $n \geqslant 2$),

(i) $e \& h \rightarrow j$, and

(ii) $j_1, \ldots, j_n$ are exclusive in pairs (w.r.t. e or h),

$$c(h, e) = \sum_{p=1}^{n} c(h \& j_p, e).$$

Proof: Since $e \& h \rightarrow j$, $e \& h \& j \leftrightarrow e \& h$. Thus applying previous results:

$$\begin{aligned}
c(h, e) &= c(e \& h, e) \\
&= c(e \& h \& j, e) \\
&= c(h \& j, e) \\
&= c(h \& (j_1 \vee \ldots \vee j_n), e) \\
&= c(h \& j_1 \vee \ldots \vee h \& j_n, e) \quad \text{, by distributing} \\
&= \sum_{n=1}^{p} (h \& j_p, e) \quad \text{, by the preceding theorem.}
\end{aligned}$$

Bayes's theorem. Where $c(i, e) > 0$ and $h_1, \ldots, h_n$ are such that

(i) $e \& i \rightarrow. h_1 \vee \ldots \vee h_n$, and

(ii) $h_1, \ldots, h_n$ are exclusive in pairs (w.r.t. e or i), then, where h is any one of $h_1, \ldots, h_n$,

a.(1). $$c(h, e \& i) = \frac{c(i \& h, e)}{\sum_{p=1}^{n} c(i \& h_p, e)}$$

(2). $$= \frac{c(h, e) \times c(i, e \& h)}{\sum_{p=1}^{n} [c(h_p, e) \times c(i, e \& h_p)]}.$$

b. Let $c(h_p, e)$ have the same value for every p (from 1 to n). Then

$$c(h, e \& i) = \frac{c(i, e \& h)}{\sum_{p=1}^{n} c(i, e \& h_p)}.$$

Proof: b is immediate from a(2). As to a,

$$
\begin{aligned}
c(h, e \,\&\, i) &= \frac{c(h, e) \times c(i, e \,\&\, h)}{c(i, e)}, && \text{by the general division theorem}\\
&= \frac{c(h, e) \times c(i, e \,\&\, h)}{\sum_{1}^{n} c(i \,\&\, h_p, e)}, && \text{by the preliminary theorem}\\
&= \frac{c((h \,\&\, i), e)}{\sum_{1}^{n} c(i \,\&\, h_p, e)}. && \text{by the general multiplication theorem}\\
&= \frac{c(h, e) \times c(i, e \,\&\, h)}{\sum_{1}^{n} [c(h_p, e) \times c(i, e \,\&\, h_p)]}, && \text{by the general multiplication theorem.}
\end{aligned}
$$

The theory developed provides but a modest beginning to ultramodal metrical probability theory. (Qualitative and absolute probability theories will be presented in [29].) But several points should already be clear. Firstly, the theory can accommodate the results of classical logical probability theory by imposing conditions on situations. Secondly, however, the theory extends to cover significant cases where the classical theory fails, especially those where neither h nor ~h, or where both h and ~h are probable relative to evidence e. Thirdly, it should be fairly obvious that the theory can be recast algebraically by taking measures on De Morgan lattices. This leads to an interesting measure theory, beyond the reach of the present venture, which removes analogues of the paradoxes which appear, yet again, in classical measure theory, notably those concerning sets of measure zero.

§13. *Ultramodal quantum theory.* There is a basis for claiming that the bad effects of classical logic extend into science itself, at least in the case of quantum physics, and perhaps also in systematic taxonomy and rigid body dynamics. An outcome in the case of quantum physics - where proposals for quantum logics date back to the decade of the inauguration of quantum theory - is that many of those who have new-look logics have suggested that their sort of logic will work for quantum theory. (Hence the labyrinth of quantum logics that van Fraassen has observed.) Ultralogic may as well be on the act. There are several approaches that an ultramodalist may take with respect to alleged logical anomalies generated by quantum phenomena, in particular, a soft line which weakens the sentential logic by dropping or qualifying distribution, $A \,\&\, (B \vee C) \rightarrow . (A \,\&\, B) \vee (A \,\&\, C)$, in line with the initial quantum logics, and a hard line which leaves the basic sentential logic unchanged.[24]

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[24] There are other lines to be tried as well, e.g. an ultramodal extension of van Fraassen's modal interpretation of quantum mechanics (see [44]).

Appropriate sentential logics for the soft line are developed and studied semantically in RLR, where it is argued that if classical logic is to be changed to accord with quantum features it can and should be adjusted to take account of other features it neglects (namely, those discussed in §2 above). But the soft line raises serious problems for the thesis that ultralogic is universal. For, firstly, relevant orthologics typically do not admit the rule (γ) of material detachment, and so interfere with the recovery of classical and modal logics. Secondly, the procedure of weakening the logic to deal with a class of quantum situations does not accord with, and indeed erodes, the thesis that ultralogic, with distribution in, is universal. Moreover the hard line has a reasonable chance of success.

The hard line is not hard like the classical stand, that the logic stands whatever the empirical data and that it is the physical theory that will have to be adjusted to take account of the curiosities and complications of quantum behaviour. For ultralogic has already taken substantial steps to modify classical logic theory, and these steps either accord with quantum logic criticisms of classical theory or else have already given away crucial parts of the classical theory on which the quantum criticism turns. As to the first point, the relevant critique of classical logic and its extensions joins with the quantum logical critique in rejecting the principle of Disjunctive Syllogism, and, more generally, in amending the classical account of negation. There is, then, substantial common ground between relevant and quantum critiques, with the result that most quantum arguments against classical logic do not apply against ultramodal logic.[25] The second point is this: the remaining quantum criticisms of classical theory, especially those that are supposed to tell against Distribution, all appear to turn on features not merely of classical quantification logic but essentially on negation features of classical probability logic - features which do not continue to hold in ultramodal probability theory.

The idea of a specific quantum logic to avoid the anomalies of orthodox quantum theory - proposed in the 1930's, not first, but most notoriously, by Birkhoff and von Neumann (see Jammer [53]) - has recently been revised and elaborated by Finkelstein (e.g. [45]), Putnam [46], and others. Finkelstein argues that all so-called "anomalies" of quantum theory, all the matters that are said to be meaningless under the orthodox interpretation, arise from the use of classical logic, which is quantum-mechanically false, and are removed by adoption of a non-standard logic. This is a controversial thesis, which has been savagely, if not very cogently, attacked; but we need not be concerned with its defence here. What is at issue is whether the non-standard logic can be the proposed universal logic, and so as to whether ultralogic can handle the cases Finkelstein and Putnam advance in favour of their thesis.

To confirm the first point - as to substantial common ground - let us consider Finkelstein's initial three cases of

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[25] Dunn persuaded me of the importance of this, of the merit of trying to do quantum theory relevantly, and that there was a solid case for pursuing the hard line - that the Boolean lattice of classical logic could be modified not just in the orthologic way but more satisfactorily in the relevant algebraic way by removing the paradox $a \leqslant b \cup \bar{b}$ and so $a \leqslant a \cap 1$.

> assertions which are false by the canons of classical logic, meaningless according to the standard version of quantum mechanics, and which nevertheless are both meaningful and true ([45], p. 47)[26]

Let us examine in detail the second, and briefest, of the examples: the others will turn out to succumb to the same treatment. A high-precision determination of the angular momentum J of a diatomic molecule gives the result J = 0. The range of the azimuthal angular coordinate of the molecular axis is divided into n equals cells: I_1 $(0 \leqslant \Theta \leqslant \delta\Theta)$, I_2 $(\delta\Theta \leqslant \Theta \leqslant 2\delta\Theta)$, ..., where $\delta\Theta = 2\Pi/n$. Then

(1) Θ is in I_1 $\vee$ Θ is in I_2 $\vee$ ... $\vee$ Θ is in I_n.

But also, for each molecule, it is false that

(2) $J = 0$ & Θ is in I_j ,

for each j, $1 \leqslant j \leqslant n$.

This is Finkelstein's "real-life" case. But classically (1) and (2) lead to inconsistency and collapse. How is the case handled ultramodally? Let us bring out the classically inconsistent assumptions by abbreviating the argument with q representing J = 0 and p_j representing: Θ is in I_j. Then

(1) $p_1 \vee p_2 \vee \dots \vee p_n$

(2) $\sim(q \,\&\, p_j)$ for each j, and

(3) q.

By (2),

(4) $\sim q \vee \sim p_j$, for each j.

Classically and modally, (3) and (4) entail $\sim p_j$ for each j, by Disjunctive Syllogism, whence

(5) $\sim p_1 \,\&\, \sim p_2 \,\&\, \dots \,\&\, \sim p_n$,

contradicting (1). But it is evident that ultramodally the argument is invalid, since it applies Disjunctive Syllogism. So there is no problem in admitting the case ultramodally; no special quantum logic is needed. (Observe that it is enough that Disjunctive Syllogism is rejected; it is not required that Material Detachment (γ) be rejected - though easily enough effected - since the premisses (3) and (4) are not provided as logical theses.) Exactly the same points apply to Finkelstein's first and third cases. (For the third, let q represent 'p_x is in I' and p_j represent 'x is J_j', and then the case is as before. The first item, though again relying on Disjunctive Syllogism, calls for more elaborate symbolisation: let p_x^+ represent '$\sigma_x = +h/2$', p_x^- '$\sigma_x = -h/2$' and similarly for p_y^+ and p_y^-. Then the premisses supplied by the Stern-Gerlach experiment Finkelstein presents are: p_x^+, $p_y^+ \vee p_y^-$, $\sim(p_x^+ \& p_y^+)$, $\sim(p_x^+ \& p_y^-)$. Inconsistency ensues again classically using Disjunctive Syllogism.) Similar points apply in the case of most of Putnam's examples. (To document cases: Putnam's first example, [46], p. 179, which is simply showing off orthologic, applies the paradox principle $p \& r \leftrightarrow p$ where r is true; the detailed example on p. 183 is just like Finkelstein's examples and classically would apply Disjunctive Syllogism, and likewise for the sketched case on p. 186.)

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[26] Finkelstein attaches to his article, 'The physics of logic', the apposite aphorism from Wittgenstein: Logic is ultraphysics. If only he had said: Physics is ultralogic.

Substantiating the second point - that the criticisms that are supposed to tell against Distribution in fact depend on taking over in an unwarranted way negation features of classical logic - involves rather more ado, since in the showdown a straight appeal back to features read off Hilbert space may be attempted. Consider, however, the alleged counterexamples to Distribution. Finkelstein's main counterexample (e.g. in [45], p. 57) in fact uses a class calculus and depends on the paradox, $A \& D \leftrightarrow D$, where D is true. Moreover the example suppresses all the essential probability details that go into the argument. Putnam's counterexample to Distribution ([46], pp. 180-81) is more fully developed, though again, it seems, insufficiently. The argument looks at the celebrated two-slit experiment. An examination of the argument reveals, however, that it depends not just on Distribution, but on other principles as well. The way in which the conceptual problems of the two-slit experiment arise, not just, or at all, from Distribution, but from other paradoxes of classical logic has been nicely brought out by Mittelstaedt (see the discussion in [53], p. 398). Let A_1 represent the assertion 'The photon in question passes through slit 1', A_2 'The photon in question passes through slit 2', and B 'The photon in question arrives somewhere on the screen'. Mittelstaedt's point, which tells against many-valued approaches, is that the principle of excluded middle, $A_1 \vee \sim A_1$, is certainly valid, but that what the classical argument assumes in the two-slit experiment,

(6) $B \rightarrow. (B \& A_1) \vee (B \& A_2)$,

is quantum-theoretically incorrect. To arrive at (6), moreover, one applies not just Distribution, but a paradox of implication, namely $B \rightarrow. B \& (A_1 \vee \sim A_1)$. Only then does (6) follow using Distribution. Thus an analysis of the two-slit experiment without anomalies does not require rejection of Distribution. None of this appears in Putnam's example, where B is neglected entirely.

Suppose, however, contrary to the evidence, that B could be detached. Putnam's conclusion is still not inevitable. For his argument also relies on repeated applications of the principle that the probability that the photon in question passes through slit 1 and passes through slit 2 (and anything else as well) is zero, i.e., in Putnam's symbols $P(A_1 \& A_2) = P(A_1 \& A_2 \& Q) = 0$. But even if A_1 and A_2 are physically incompatible, as Putnam assumes, that is, even if it is physically impossible that the photon passes through both slit 1 and slit 2, it does not follow, on ultramodal probability logic, that the logical probability that it does so is zero. I put it to you that, should matters ever come to such a point, this way of breaking the classical argument is at least as plausible as the rejection of Distribution.[27] There remain of course other moves that can be fallen back upon, e.g. the dialectical strategy of simply allowing that some photons pass through both slits, that photons are, at once, both particle-like and wave-like. In fact, the options for description of quantum phenomena remain alarmingly open.

The appeal of an orthological resolution of quantum anomalies, as distinct from a resolution by way of another non-classical logic, goes back to the intimate connections of orthologic with the mathematical formalism of quantum theory in terms of Hilbert space and its subspaces. In order to present a convincing case for the ultralogical way of doing quantum theory, the mathematics of Hilbert spaces will have, eventually, to be relevantly recast. And this involves recasting analysis. Thus an ultramodal quantum theory is going to require for its underpinning an ultramodal analysis - which takes us back to the larger ultramodal program awaiting development.

§14. *The way ahead.* Very much remains to be done, far more than can be achieved in standard research project lifetimes by the small band of researchers currently working on relevant and ultramodal logics. Perhaps the formulation and initiation of an ultralogical program will spur research in one or more of the following ways: by attracting some to join and foster the ultralogical program; by encouraging the formulation and development of rival relevant ventures; and by inciting opposition to the program from some who develop the program with a view to refuting or undermining it. I invite the reader to participate in this exciting program, if not by joining it, then by beating it.[28]

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[27] It is not evident that someone committed, as Putnam is, to quantum logic is entitled to apply classical probability logic. Orthologic should generate its own non-classical probability logic, as critics of Popper have pointed out (see Jammer [53]).

[28] This paper was presented, in part, at the Third Latin American Symposium on Mathematical Logic, held at Campinas, Brasil, July 1976.

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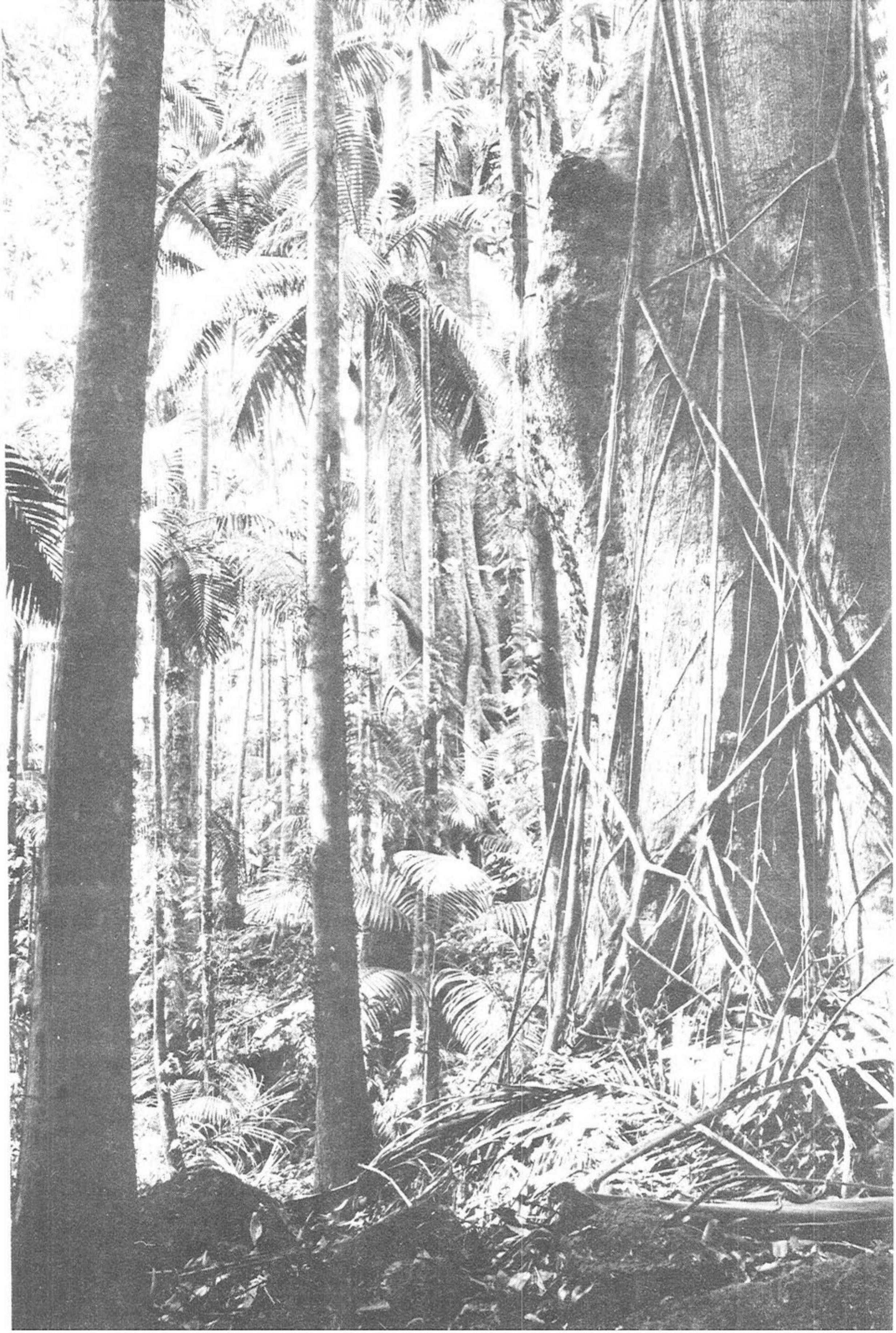

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